An Ecological Examination of Open Educational Practices Supporting the Design, Development, and Delivery of OER in Tertiary Education

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Abstract

Open Educational Resources (OERs) are widely available, as are guides for tertiary education institutions to engage with them. However, despite this accessibility OERs are not widely used. Open Educational Practices (OEPs) in the form of institutional supports (e.g., tools, policies, professional development, project funding) can facilitate OER engagement. The problem is that OEP implementation is complex and challenging. There is a lack of models to guide this complex process. This research aimed to examine OEP implementation and OER engagement through an ethnographic case study of the OERu and two of its Partner Institutions. This study drew on a range of qualitative data, including interviews, meetings, documents, observations, and co-facilitation of an online micro-course. Data comprised OERu's use of open source technology, its open philanthropy, and its open communication platforms and processes. I also collected data on the OEPs of design, development, and delivery of courses as OERs.

Davis' Arena of change with technology in education, a global and ecological framework based on human ecology, provided a lens for examining OEP implementation and OER engagement in pilot projects. The associated roles and "non-living matter" (inanimate resources) and their interactions across ecosystems were analyzed. Cox and Trotter's OER adoption pyramid complemented the Arena by enabling examination and categorization of barriers and enablers to these processes. The barriers and enablers were reconceptualized as stressors that could stimulate evolution of education and technology in the institutions' ecosystems.

The research revealed how institutions functioned as ecosystems, and how they led to different forms of educational and technological evolution as well as co-evolution of technology and education. Some ecosystems focused on technological innovation while others focused on pedagogical evolution. Findings indicated ways in which the systems could work together more cohesively for more favorable and sustainable innovation using OER. Using the OER adoption

pyramid revealed stressors related to OER engagement and OEP implementation. The stressors formed patterns according to roles, ecosystems, and the Pyramid's categories. These patterns were investigated with a view to obtaining practical information for planning open education innovations.

This research contributes to the literature on open education by using an ecological framework to examine innovations in open education at tertiary institutions. It also provides an extension to the Arena framework by using the OER adoption pyramid to examine stressors found within the institutions' ecosystems. This research builds on successful national and institutional leadership in New Zealand with regards to open licensing, open source software and open education. The findings are applicable to tertiary institutions interested in engaging with OER and OEP and can be used as models for other institutions to plan open education innovations.

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Glossary

Digital literacy skills

Digital literacy skills refer to the use of technology and the internet for communication and collaboration, using a variety of media, applying ethics, learning to use software, and using critical thinking skills for searching for and evaluating online content, among others (Bates, 2015; Erstad, 2011; Jenkins, Purushotma, Weigel, Clinton, & Robison, 2009).

Instructional design

According to Chen (2008)

> Instructional design (ID) is the systematic process of planning events to facilitate learning. The ID process encompasses a set of interdependent phases including analysis of learners, contexts and goals, design of objectives, selection of strategies and assessment tools, production of instructional materials, and evaluation of learner performance and overall instructional design effort (p. 1).

While the term "instructional design" is common in North America, a term commonly used in Europe and Oceania is "learning design" (Conole, 2013). Conole, Oliver, Falconer, Littlejohn, and Harvey (2007) offer a definition for Learning Design which refers to the Instructional Management Systems Global Learning Consortium:

> an application of a pedagogical model for a specific learning objective, target group, and a specific context or knowledge domain. It specifies the teaching and learning process, along with conditions under which it occurs and the activities performed by the teachers and learners in order to achieve the required learning objectives (2007, p. 114).

Chen (2008) focuses on instructional designers' processes while Conole et al. (2007) focus on teachers' and learners' roles and learning conditions when developing learning approaches. Both definitions are useful for this thesis.

Micro-credential

"A micro-credential is a proof of the learning outcomes that a learner has acquired following a short learning experience. These learning outcomes have been assessed against transparent standards" (European Commission, 2020, p. 10). In the context of the current research, micro-credentials are associated with micro courses, which each represent 40-50 notional hours of study (ICDE, n.d.). The OERu builds its courses as micro-courses so that its partner institutions can combine a suitable

number of them (3 or 4 micro-courses) to form a course that they can accredit. The OERu's micro-courses tend to take two weeks to complete.

Open access

Open access (or open research or scholarship) refers to openly licensed articles or journals that are free for downloading and may provide for open peer review (T. Anderson, 2013).

Open admission or open enrollment

Open admission or open enrollment to courses or programs(Cronin, 2017) reduces barriers to education like age limits. Open courses for credit may have a cost attached for completing an assessment and receiving feedback. Open courses not for credit have value in allowing for development of knowledge or skills and complementing for-credit courses (Conole, 2013).

Open boundary course

An open boundary course is a course where students can choose to obtain credit or participate informally, out of interest. Open boundary courses are delivered on an openly accessible lerning platform.

Open course

Open courses are courses built on open platforms such as an open Learning Management System (LMS), a blog, or a wiki. They may include the use of additional open source or free software, as well as social media. The content is openly licensed. Enrollment may be open to anyone or may have pre-requisite course(s). Open courses can be left on the internet to be taken by individuals or they can be cohort-based, which allows students to build online learning networks. Thus, open courses can provide for open learning (Conole, 2013).

Open design

"Open design refers to the creation and development of potentially meaningful learning experiences through open and transparent collaboration among course developers and peers using open educational resources, open educational practices and open technologies" (Mackintosh, 2016a, n. p.). By using OERs to build courses, the reuse and remixing processes are intended to be efficient

and sustainable. The openness of the materials, process, and platform allow developers to work iteratively at a distance on a course and to comment on each other's contributions (Conole, 2013; DeVries, 2013; Mackintosh, 2016).

Open license

A definition for open licenses was recently adopted by UNESCO: "Open license refers to a copyright license that respects the intellectual property rights of the copyright owner and provides limited permissions granting the public the rights to access, use, adapt, and redistribute educational materials" (UNESCO, 2019, p. 4).

Open pedagogy

The term "open pedagogy" is defined in a variety of ways, and I adopted the definition provided by a group that attended the OERu's 2018 International Partners meeting:

> [Open pedagogy is an access-oriented commitment to learner-driven education and a process of designing architectures and using tools for learning that enable students to shape the public knowledge commons of which they are a part. A related concept, OER-enabled pedagogy, refers to the set of teacning (sic) and learning practices only possible in the context of the 5R permissions which are characteristic of OER. For example engaging learners as creators of information rather than comsumers (sic) by not using disposable assignments. Open pedagogy may offer pathways to enhancing the future sustainability of OER while improving the quality of learning (OERu, 2018r).

OER-enabled pedagogy is defined elsewhere (Wiley, 2017) and disposable assignments are defined by Jhangiani (2015; 2017).

Open textbooks

Open textbooks are online textbooks that are openly licensed, and thus, free for students to use. Open textbooks are an example of OERs (Butcher, 2011).

Open source

Open source refers to software whose source code is openly license for modification and ideally at no cost. More details are available (Opensource.org, 2007).

OEP

The definition of OEP that I am using was presented in section 1.1. Since the start of my research, additional definitions have emerged that refer to teaching and learning with a focus either on the faculty's and students' roles (Cronin, 2017) instructional design involving faculty and students (Paskevicius, 2017) or social justice (Lambert, 2018).

Chapter 1. Introduction

New Zealand is a leader in the global Open Education Resource (OER) movement, with a national policy on open access and licensing (Mackintosh, 2012; New_Zealand_Government, 2014), and commitment to improving the use of technology in open education (Tertiary_Education_Commission_NZ, 2014). New Zealand hosts the OER Foundation (OERF) and Open Education Resource universitas (OERu), both led by UNESCO Chair of OER Wayne Mackintosh. The OERu is a network of tertiary education institutions (including polytechnics and universities) dedicated to open and distance learning based on Open Educational Practices (OEPs) (OERu, n. d.-a). The OERu's mandate is to develop and deliver open courses and make them freely accessible to students anywhere, often by involving volunteers from its Partner Institutions (PIs). The University of Canterbury (UC) was a founding member of the OERu and designed a short open course as part of its collaboration with the OERu (Davis & Mackintosh, 2013). This research aims to build on that leadership by examining the implementation of OEPs including those of design, development, and delivery of OER as courses at the OERu and two of its PIs and to increase New Zealand's profile in tertiary education overseas. In turn, an examination of the findings intends to contribute to scholarship and practice by increasing knowledge about planning for innovations involving OER engagement and OEP implementation when considering a tertiary institution as a part of a larger holistic ecosystem with global reach. Factors identified as enablers or inhibitors in OER and OEP initiatives are considered as well, since they provide a stimulus for learning and evolving to new forms and uses of education and technology.

In this chapter, the context and the problem at the heart of this research are outlined to provide the rationale for this work. Subsequently, I explain how my research can further the contribution by New Zealand to open education research and practice. This explanation reveals the purpose, research questions, general plan, theoretical foundations, the scope, and importance of this study. My

experience and personal interest in undertaking this research are described to situate my role in this study.

1.1. Context

In tertiary education, there is increasing awareness and engagement with Open Educational Resources (OER) which "are teaching, learning and research materials in any medium that may be composed of copyrightable materials released under an open license, materials not protected by copyright, materials for which copyright protection has expired, or a combination of the foregoing" (UNESCO, 2019, p. 4). There are also plenty of OERs available to address increasing demands for tertiary education, and UNESCO, the Commonwealth of Learning, and the European Commission have published several books for guiding the adoption of OERs (e.g. Butcher & Hoosen, 2012; dos Santos, 2019; Glennie, Harley, Butcher, & van Wyk, 2012; Hoosen, Moore, & Butcher, 2016; Miao, Mishra, & McGreal, 2016; UNESCO & COL, 2015). However, to make use of OERs – particularly to foster digital literacy skills – requires the implementation of Open Educational Practices (OEP): tools, policies, instructional and technological training, quality assurance frameworks and other resources and infrastructure which facilitate the use of OERs (Conole, 2012). The implementation of OEPs is complex and not well understood.

1.2. The problem

Despite the proliferation of and global support for OER, the implementation of OEP in the tertiary education sector is slow. Where OEPs do occur, challenges in planning and implementation hinder adoption. There are no models that guide this process while addressing the complexity of implementing processes of changing from commercial resources and closed practices to OER and OEP in tertiary education. There is also a paucity of research on the organizational cultures underpinning OER engagement and OEP implementation.

1.3. Purpose of the study and research questions

The purpose of this study is to examine OER engagement and OEP implementation - particularly the design, development, and delivery of openly licensed courses – and the supporting OEPs that are

required for them to occur such as professional development for building OERs. Additional OEPs such as organizational processes at the OERu and its Partner Institutions for increasing access to tertiary education will be examined. OEP implementation as an innovation inherently leads to the discovery of enablers and barriers of OER engagement. In this research, they are also referred to as "stressors". The institutions in this research developed OER as different types of pilot projects, and the stressors encountered by the participants involved are crucial to fully describing OEP implementation. This is why a large part of this research is dedicated to examining them. The research also examines indicators of organizational cultures that influenced OER engagement and OEP implementation. The thesis adopts an ecosystem view to consider the complexity of components involved in designing, developing, and delivering a given course within an organization and its regional, national, and global contexts. The intended outcome is to develop models for guiding OEP implementation using a framework. Its role: to facilitate and shape the understanding of the processes and interactions involved during a past OER or OEP innovation. This type of understanding can assist with planning for further innovation using OER and OEP. These models begin to solve the problem outlined above; they offer tertiary education institutions guidance in establishing procedures that support OER engagement. In turn, the result can be increased course quality in terms of pedagogy and technology use and increased access to tertiary education.

Main research question

In what ways are tertiary education institutions that develop openly licensed courses implementing Open Educational Practices?

Guiding sub-questions

- What is the typology associated with the organizational cultures of the institutions involved in this research?
- How are tertiary education institutions implementing OEPs, particularly for instructional design, development, and delivery of OER as courses?
- What are the stressors involved in OER engagement and OEP implementation?

1.4. Plan for the study and researcher roles

This research involved two phases: the pilot study and the main study. In the pilot study, I conducted an ethnographic case study to examine OEP implementation at the OERu. Its mission was to coordinate tertiary institutions to provide access to education by using OER and open source technologies in sustainable and affordable ways. I began a case study of OEPs related to the OERu's organizational OEPs (open source technology, open philanthropy, and open communication) and OEPs of course design, development, and delivery processes. The findings are largely based on the OERu CEO's perspective, and they include views from participants at other institutions. In addition to these findings is an anecdote about a pilot project resulting from a partnership between the OERu CEO and a participant named Wanda and my participant observation of a two-week online micro-course called LiDA103. The aim was to identify how OEPs were implemented as part of a holistic and global ecosystem and to examine the stressors that arose when implementing the OEPs. I also used the pilot study to identify Partner Institutions (PIs) to be the subjects of vignettes of OEP implementation in my main study. In the main study, I continued research on the OERu. I also conducted vignettes (ethnographic case studies of a smaller scope) involving two of the OERu's PIs. I briefly examined their OEP of increasing access to education and focused on their respective OEPs of course design and development.

This research involved interviews with administrators and instructional designers or faculty who developed courses as OER. Use of the term "faculty" in this research relates to the role of developing courses and teaching. I interviewed them about their role in implementing OEPs, particularly design and development of openly licensed courses. OER course delivery by PIs was not examined because it had not occurred. My role in the pilot study was that of a researcher only, and it continued in the main study. Another role I had in the main study was a combination of participant-observer and volunteer facilitator in a mini-course delivered online by the OERu for two weeks. This research was approved by the Educational Research Human Ethics Committee at the University of Canterbury.

1.5. Theoretical framework

Drawing on an ecosystem approach to understand OEP, I used Davis' (2018) *Arena of change with technology in education* as a global framework. The Arena represents a tertiary education system composed of ecosystems, living matter such as species (roles within the system) and non-living matter (e.g., physical or digital resources, policies, etc.) associated with an educational setting. Faculty members or instructors and course developers or instructional designers are examples of roles involved in leading change with educational technology. The change is seen as an evolution of a system in the way that technology is used or education is facilitated. Depending on how species in the system behave, technology, education, or both can evolve. Alternatively, technology and education can stimulate each other to evolve in a process called co-evolution (Davis, Eickelmann, & Zaka, 2013). This framework also enabled me to explore whether change with educational technology could become sustainable or not in a system (Davis et al., 2013).

I examined the roles and their interactions as well as the processes and resources involved in designing, developing, and delivering courses in an open, online environment. With the resulting findings, I created diagrams to visualize the matter of each institution's system. The visual supports and framework concepts allowed for a greater understanding of the systems and OER engagement and OEP implementation. In turn, new knowledge was gained regarding system sustainability about evolution and co-evolution of education and technology. Thus, when Davis' (2018) Arena framework is used to analyze OEP implementation in a complex tertiary education ecosystem, the output is information that can assist with further innovation.

Cox and Trotter's (2017b) *OER adoption pyramid* facilitated and organized my examination of enabling and inhibiting factors. They were collectively called "stressors" to adhere to ecological terminology. Stressors both result from and influence OER engagement and OEP implementation. The resulting knowledge stimulated my exploration of how institutions faced these stressors. The

OER adoption pyramid is a framework originally developed for organizing enabling and inhibiting factors in categories in a hierarchical structure. The categories are ordered based on the amount of control that a faculty member has over the stressors versus the amount of control the institution exerts. I used the Pyramid to extend the analysis using the Arena framework, which resulted in the inclusion of all roles and all levels (course, organization, region or nation, global level) in the analysis of stressors. The Pyramid framework is useful in planning for OER engagement as it does more than assist in listing OER stressors; its hierarchical structure signals their relative importance in influencing OER engagement. Thus, it facilitates planning. By analyzing the stressors using both the Pyramid to categorize the stressors and the Arena to describe them within holistic ecosystems, I increased my understanding of how they influenced OEP implementation.

In Davis' (2018) Arena framework, change is influenced by the cultures of all species in their respective ecosystems. In a course ecosystem, the cultures refer to national cultures as well as the individuals' patterns of behavior. In an organizational ecosystem, we refer to the organizational cultures. When referring to the organizational cultures of the institutions in this study, I pluralize the term since an organization tends to have multiple cultures where one may dominate (Cameron & Quinn, 2011). When using the singular term, it is to refer to the concept in general, or to use the term the way other authors did when I am citing their work. Anyone interested in leading change with educational technology must account for the cultures in the system and how they might influence education and the use of technology. To that end, I sought out evidence of organizational cultures of the institutions in my study. My understanding of organizational cultures was assisted by the typology and language presented in the *Competing values framework* (Cameron & Quinn, 1999). I used this typology to interpret the values that help to shape organizational cultures. This examination corresponded to the second of three levels of organizational culture as outlined by Schein and Schein (2016): the level of *espoused values*. The importance of this portion of the research was to demonstrate how innovations such as OEP implementation are influenced by

aspects of organizational cultures. I also described aspects of organizational culture that relate to the first level of the Schein and Schein (2016) framework, which is about *artefacts* such as planning documents and organizational structure. These findings were examined for the purpose of describing the context of each institution in the current research.

1.6. The inspiration for this project and its importance

My professional and volunteer experiences in open education inspired this research. As an instructional designer at the African Virtual University (AVU) for more than two years, I coordinated the work of international faculty members. We designed and developed courses as OERs in undergraduate programs and a professional development program, the latter of which I delivered with colleagues. Additionally, I volunteered with the OERu and L'organisation internationale de la Francophonie in the open design and delivery of OER-based courses. The course topics, respectively, were the dimensions of Open Educational Practices and the design and development of open courses. These experiences increased my knowledge related to the OEPs of collaborative design, development, and delivery using open source tools.

I encountered challenges during these experiences with OER and wondered whether other tertiary education professionals had similar challenges. Further, I aimed to examine how the OERu could contribute to providing access to tertiary education. I was aware that open education alone was not the solution, but that many factors contributed to inhibiting access to learning (Brown & James, 2020; Marginson, 2016). Therefore, it was important for me to uncover the role that tertiary institutions could play in increasing access education. To this end, I had several questions. Did the OERu and its PIs develop OER-based courses in a sustainable fashion? For answers, I examined the OERu and its PIs' OEPs. According to DeVries (2013), research such as this is valuable since not all faculty who volunteered to develop courses for the OERu were able to fulfill their commitment. Therefore, it is worthwhile examining their challenges and sustained practices.

With a view to explaining the scope, this project concerns Open Educational Practices as they are applied by tertiary education institutions offering online instruction. Tertiary education institutions can describe themselves as being "open" based on various criteria. The selected institutions are located in developed English-speaking countries and have created at least one course for the OERu. The processes for developing OER described in this thesis may be easier to replicate in tertiary education institutions in developed countries where OEP are already being implemented to some degree. However, the frameworks should be applicable in most tertiary education institutions.

The importance of this study is that it addresses a lack of research on institutional implementation of Open Educational Practices. In particular, it addresses how OEPs can be used to design high quality open courses for tertiary education. Through adopting an ecological approach (Davis, 2018) to understand the complexity of the whole system and then drawing in an exploration of stressors to *OER adoption* (Cox and Trotter, 2017b) that influence OEP engagement and implementation, I contribute to an understanding of how tertiary education institutions can implement OEPs. This is significant if organizations want to use OER in sustainable ways to increase access to tertiary education.

1.7. Conclusion

This chapter exposed the components of the current research, which launches off of projects led by the New Zealand government and the OERu. This chapter provided a definition of OEPs that is adopted in this research and that pertains to institutional actions, policies, and resources as well as infrastructure that support OER engagement (Conole, 2012). An overview of my research as an ethnographic case study was presented, including the research questions and theoretical framework. The research design was informed by my professional experience in tertiary open education, and the intended result is to provide guidance on effective OEP implementation. In turn, the hope is to provide students with greater access to a high quality learning experience through

open education. In the next chapter, I explore the role of theories and provide a summary of the frameworks used in this research.

Chapter 2. Theoretical framework

This chapter examines the theoretical framework used in this research. I begin by exploring what theories are and how they are used (section 2.1.). I subsequently describe frameworks that underpin my research in this order: a theoretical and ecological framework for gaining a holistic understanding of educational technology innovations (section 2.2.), a framework for categorizing barriers and enablers to OER engagement and OEP implementation in a hierarchical fashion (section 2.3.), and a theoretical framework regarding values as part of organizational cultures (section 2.4.). I end the chapter by explaining how I applied the theoretical framework to my research (section 2.5).

2.1. The role of theory

Theories consist of coherently related formal concepts, variables, constructs, generalizations, principles, and hypotheses for explaining a phenomenon (Creswell, 2014; Gay, Mills, & Airasian, 2009; Silverman, 2013) or for organizing information about the phenomenon to increase understanding about it (Silverman, 2013). Silverman further describes theories as being dynamic and self-confirming since they shape how we examine phenomena. Theories are used to describe, increase, or change the understanding of behaviors, attitudes, an activity or a process and are developed in relation to a given subject area (Gay et al., 2009). In my research, I aimed to explain how different institutions design, develop, and deliver open and online courses. The Arena of change with digital technologies in education (Davis, 2018) is suited to this purpose because it was derived from theory based on human ecology for the examination of situations where technology is used in education. The Arena extended by the OER Adoption pyramid (Cox & Trotter, 2017b) was used to gain an understanding of the influence of stressors on OEP implementation. Both the Arena and the Pyramid are valuable in planning for innovation in open education.

Additional roles of theory are to stimulate researchers' thinking throughout their study, to add conceptual richness to the study, and to inform directions for future research (Gay et al., 2009). A theory can also be used to inform the research method, highlight points of interest related to the

research question, shape the reporting method, lead to suggestions for further exploration or improvement (Creswell, 2014), inform practice, shape policy development (Silverman, 2013), assist in making meaning out of data, and form abstract interpretations rather than simply writing descriptions. This approach helps in condensing essential points of a study and facilitates communication about it (Gay et al., 2009). Bryman (1988) cautions that a researcher can be influenced by a theory such that data collection and analysis is conducted more as a function of the theory than of what the data and participants are saying. Thus, the researcher must minimize the effect of bias and must balance between appropriately applying a theory to design and conduct a study and allowing the data to emerge naturally, all the while recognizing a theory's strengths and limitations.

The role of theory, as described by the authors cited above, was considered when planning my research. In my analysis, I used the concepts of the keystone species, species, non-living matter, global ecosphere, national ecozone, organizational ecosystem, course ecosystem, evolution, among others from the Arena, as well as the six categories of Access, Permission, Awareness, Capacity, Availability, and Volition from the Pyramid framework (Cox & Trotter, 2017b). These concepts' meanings became clearer as I worked with them in producing diagrams and tables and writing an analysis. As meanings clarified, biases and mis-labeling diminished. There may have been bias in my interpretation, since I have a stronger understanding of the roles of instructional designer and student than any other role in the system. Thus, I was able to elaborate more on those roles and interpret them in greater depth than others.

To use the Arena to analyze and interpret my findings, I needed to obtain enough information about the species, keystone species, and matter involved in each case. The same applied to the stressors and the Pyramid. I needed to select cases where a course was developed as some form of innovation. The reason is that the Arena (Davis, 2018) was used as a framework to analyse change

with educational technology, and innovative courses are an excellent example of such change. With the OERu, I chose to present the LiDA course as an innovation because its design, development, and delivery processes were innovative. I can say this with the authority of my instructional design and teaching experience in multiple tertiary education institutions. The OERu CEO saw the innovation as being the development of an ensemble of loosely-coupled open source tools that support text-based student-student interaction in LiDA and other OERu courses. However, given my position that technology should be used in the service of pedagogy for an improved learning experience for students, I chose to place instructional design at the center of the OERu's Arena. At IIIU and EEEU, I identified the innovation again as the design and development of a course because these processes stimulated several forms of evolution for those roles as the individuals involved learned about designing in open environments and for open, online learning. Examples consisted of learning to code in WikiEducator and coming to terms with the vulnerability of working in an open online environment where anyone with internet access had the potential to observe your progress. Since the three cases had a reach that was local to global, I needed to obtain information on how they each interacted within the course and organization ecosystems, the regional or national ecozone, and the global ecosphere. Through interviews, document analysis, and observations of videos, I was able to form a complete picture.

2.2. Davis' (2018) Arena of change with digital technologies in education

The Arena is a theoretical framework based on *ecology*, and more specifically, *human ecology* that aims to support an understanding and provide a holistic, global perspective on change with educational technology. Ecology involves examining interactions among beings with each other and their environment in networks and within and across ecosystems (Steiner, 2016). The networks and interactions allow the different species to accomplish more than they could individually (Steiner, 2016). In human ecology, all of the actions within a system are considered to make up an interconnected whole known as an ecosystem (Devi T. V., 2019). The metaphor of the Arena is that the faculty member's activity in the classroom or online course is a performance, and 'actors' at all

levels include the 'audience' who participate in the performance too (Davis, 2018). Thus, the metaphor implies that there are interactions throughout the system.

Human ecology allows for social theorizing to explain human agency and environmental factors and the causes and effects they have on humans and the environment (Devi T. V., 2019). More specifically, they facilitate an understanding of relationships in systems by mapping relevant past and current matter onto a diagram, such as an Arena diagram, to represent the known situation (Steiner, 2016). This understanding supports planning to imagine what could be (Steiner, 2016) such as planning for innovation in educational technology. The Arena framework facilitates organization of roles and resources related to educational technology onto a map representing several layers, from the course level to the global level within a system. Ecological frameworks help to develop an understanding of parts, resources, actions, or "matter" by organizing them and highlighting those that are significant in answering research questions (Devi T. V., 2019). When applying the Arena, roles are referred to as *species* or *living matter*, and resources are called *non-living matter*. Species and non-living matter together comprise the *matter* within the system. Among the species are *keystone species*, which are influential within their environment – the ecosystem. For example, an instructional designer who is also the subject matter expert for a course is the keystone species within the *course ecosystem* during the process of course design and development. However, if the role subject matter expert of subject matter expert has the final authority on course design, then this role is the keystone species. During course delivery, the role responsible for course delivery or facilitation – likely faculty member – becomes the keystone species, responsible for managing the matter and behavior of the students so that the course ecosystem can be stable and sustainable. If the course ecosystem became too stressful for some students, they might leave it. If the faculty member teaching the course were to introduce a technology without offering adequate support for students to use it effectively, it would be disruptive to the course ecosystem. Species in an ecosystem can select, experiment with, adopt, adapt, or abandon technology.

Steiner views human ecosystems as having power structures. He claims, “Whether centralized or more diffuse, the most successful power structures adjust to change through time” (Steiner, 2016, p. 22). When the ecosystem in question contains diverse species that are cohesive, it is less vulnerable to negative impacts due to having greater options and skill sets allowing for adaptation. In turn, it is more sustainable – or more capable of regeneration and advancement - than less diverse ecosystems. Diversity can increase with both the number and variety of species (Steiner, 2016).

If two sections of the same course were offered simultaneously by different faculty members, they would be neighboring ecosystems forming a community of ecosystems. If one course section became too stressful for students, they could change their course registration and move across to the other course ecosystem. If one of the faculty members were a member of a professional development committee on the topic of educational technology (or any topic), the result would be to create a *bridge* with the ecosystem; the faculty member allows for the flow of matter and knowledge between the two ecosystems.

As a technology is adopted in a course ecosystem, the faculty member and students may encounter stressors that have a positive or negative impact. For example, a mind-mapping technology may be introduced to facilitate interaction among students, allowing them to organize their thoughts visually. Students might initially encounter stressors such as difficulties as they learn how to use the technology. These stressors can stimulate students to change their behavior such that they communicate with their course mates differently. The students’ approach to learning might also change. Students might be stimulated by the technology and use it in creative ways. These responses to stressors are examples of how a change in technology or technological evolution stimulated educational change or evolution. The reverse can occur as well, with education stimulating the use of technology. When technology and education stimulate each other to evolve,

this process is called co-evolution. Technology and education can each evolve separately as well. The evolution can be managed in an effort to obtain desired results or can lead to unexpected results which may be desirable or not. The intention is for the evolution to occur in a desirable, manageable, and sustainable fashion. Innovations that can be analyzed using the Arena framework include the evolution and co-evolution of OER, OEP, and related technologies such as open source software developed by the OERu.

The timing of an educational technology innovation is important. It can occur during the steady state of an academic session or during a transition state between sessions after which the former steady state is re-established. Major changes such as adopting a learning technology for broad use across an institution occur more easily (cause less disruption) during the transition states when the system is re-organizing itself than during a steady state (Davis, 2018).

In an ecological framework, the complex systems are organized into theoretical hierarchies (indicated as nested circles in Figure 2.1) (Steiner, 2016). In the Arena, the course ecosystem is nested within the organizational ecosystem of the institution, which can contain hundreds of course ecosystems as well as support ecosystems populated by IT support staff or administrative ecosystems. The organizational ecosystem can be considered to be nested in larger layers such as a municipal, regional, or national ecozone. The highest layer is the global ecosphere that contains the ecozones and ecosystems.

Within a set of nested systems, larger ones are expected to adapt more slowly while possibly imposing limits on the smaller systems within. Major disruptions can be harmful to larger systems, whereas the smaller systems within can re-organize more quickly and continue functioning (Steiner, 2016). Additionally, the introduction of a learning technology can cause ripples across ecosystems. For example, New Zealand's initiative to upgrade Moodle changed the way elearning occurred in

institutions. It constrained the institutions since some of them may have preferred to use a different learning platform. Within their respective organizational ecosystems, institutions could choose to configure Moodle in a particular way, assign a given number of IT staff to supporting Faculty's use of Moodle, and offer professional development for designing courses for online learning. Within the course ecosystem, Faculty could choose to apply what they learned in professional development sessions; they could build a course containing several discussion forums and prepare automated quizzes.

The Arena not only organizes species and non-living matter according to layers. It also organizes them according to five sectors: Resources, Professional, Community, Bureaucratic, and Political. As an example of using the Arena framework to analyze the situation above, the NZ government in the political sector launched an initiative with the cooperation of executives (keystone species) in the bureaucratic sector of an organizational ecosystem. The executives would have called upon IT staff from the professional sector to work with the open source coding in the resource sector. Faculty, also in the professional sector, could adopt OER from the resource sector in the global ecosphere (found on the internet) and adapt it for use in Moodle for students in the community sector. While class is in session, students are in the course ecosystem. When it is not in session, but students are enrolled at a university, the students are considered to be a part of the organizational ecosystem. Students enrolled at separate institutions in NZ would be in the National ecozone, and students from other countries enrolled abroad would be plotted in the global ecosphere. All of these students would be mapped in the community sector, as would their families. In short, the Arena framework provides a holistic, global view of change with educational technology over time, and in all its complexity.

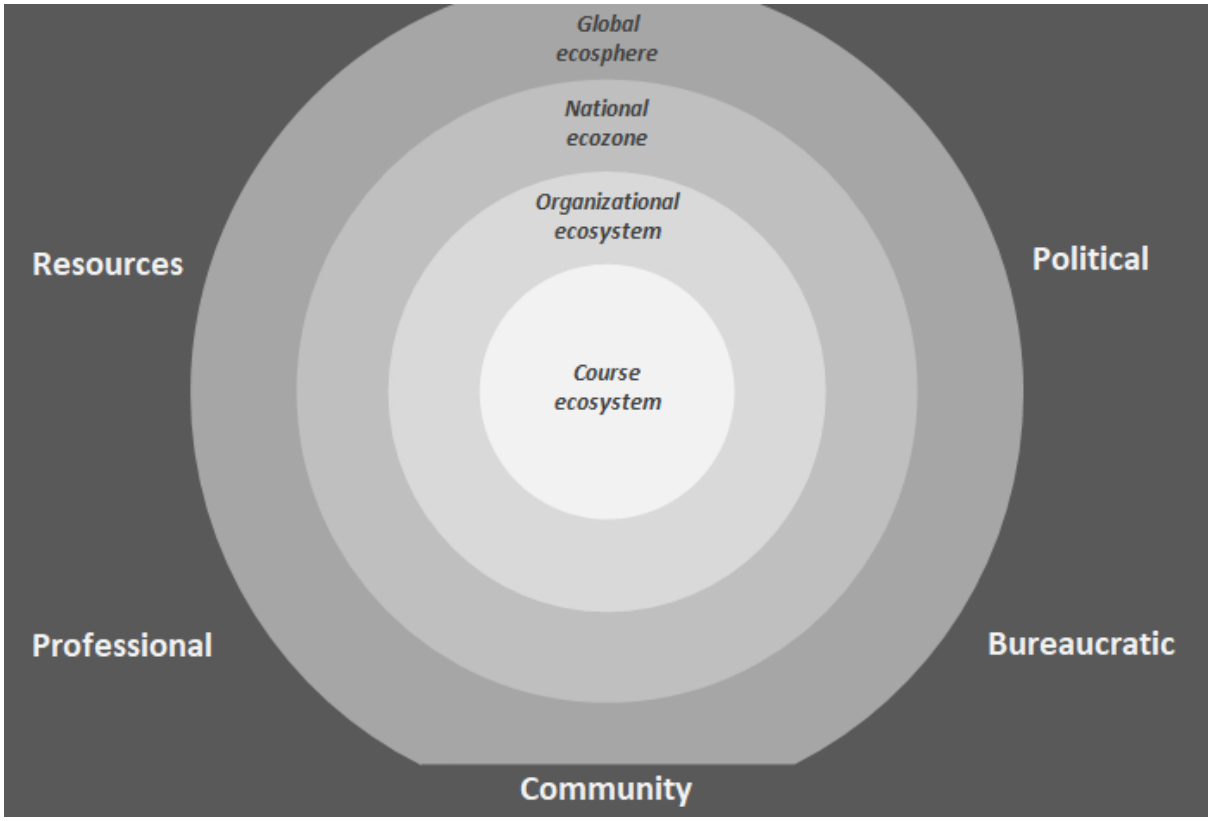

Figure 2.1. A blank Arena diagram

Therefore, Davis' Arena can be applied by those aiming to change tertiary education to see the big picture and visualize how the change can affect roles (species) and non-living matter, as well as their interaction in and across ecosystems (Davis, 2018).

Concepts such as flow of energy and interactions imply dynamism in the system, and evolution and change imply that events occur over time. Consequently, an examination of a static Arena diagram carries risks of erroneously assuming that all presented matter exists simultaneously and interacts equally with all other matter. This is why the Arena descriptions highlight key interactions while telling a story about how an educational technology innovation stimulates events overlapping in time and space. When reading an analysis of an Arena, one should frequently refer to the diagram in question. As an indication of how the Arena analyses are structured, they roughly involve describing key interactions within each level and across levels. Given the complexity of the systems, it is not

possible to describe them all in a strictly identically structured fashion. These systems represent real situations and embrace their chaos.

This framework has been used in a recent study by Davis, Harris, and Cunningham (2019) in examining an early childhood center (ECC) for multilingual students in New Zealand. The authors mapped the ECC and associated matter onto an Arena diagram. They described relationships therein based on data from interviews with parents, teachers, and one librarian in an ethnographic case study. Davis' (2018) Arena was similarly used in an ethnographic case study of a New Zealand secondary school (Farshad Nia, Davis, Cunningham, & Howard, 2018). The authors described how a secondary school teacher of English as a second language evolved his use of educational technology as he experimented with and reflected on it. His students included immigrants and refugees. In the study by Davis et al. (2019), e-portfolios stood out in the Arena as an evolving educational technology. They had recently been adopted and proven useful for many purposes, but risked revealing too much information about students. This point led the authors to recommend that educational technology companies act in an ethical and trustworthy manner, that they provide effective learning tools, and protect students' information. The study by Farshad Nia et al. (2018) highlighted the challenges of adopting technology and the low likelihood that most teachers would undergo a process similar to the successful one in the study. In both studies, the Arena clarified complex educational situations and highlighted matter (e-portfolios) or processes (increased adoption of educational technology across an institution) that could inform future behaviors regarding educational technology.

Literature referring to ecological frameworks

A systematic review of the literature on learning ecologies examined the alignment of ontology, methodology, and application in a large number of studies (Sangrá, Raffaghelli, & Guitert-Catasús, 2019). It also explores ongoing qualitative research on relationships within the ecological system of

four Australian universities as they implemented OEP initiatives (Stagg, 2017). Having suspected that there were gaps or errors in studies of learning ecologies involving educational technology, Sangrá et al. (2019) conducted a systematic review of the literature to examine the design and application of such studies. Sangrá et al. (2019) examined 85 papers found in five scientific databases without search constraints on time or discipline. They noted a low amount of studies with interventionist or experimental methodologies - studies that intervened in the students' learning process or evaluated the impact of an educational innovation (Sangrà et al., 2019). Within those studies, the authors found poor theoretical, ontological, and methodological alignment, which reduced their quality. They found that there were relatively few studies aimed at developing and implementing educational interventions. Thus, they called for more studies with research-based design and longitudinal studies in learning ecologies. In addition to the gaps in the research, the authors provided suggestions for including students in the research so that they can become more aware of their learning ecologies and increase their autonomy.

A more focused examination of a single ecological framework was provided by Stagg (2017). Motivated by a desire to understand the stakeholders of OEP and their barriers in a global context, Stagg explored the application of an ecological framework for the implementation of OEP as a preliminary step in his research. Stagg (2017) used Bronfenbrenner's (1979) ecological framework to examine relationships among ecological systems with a view to recommending OEPs suitable for given contexts. This case study research involved a survey and semi-structured interviews with participants from four Australian tertiary education institutions that implemented OEP. The researcher intended to perform a meta-analysis of the four cases and advocated for openness and policy-making with an intention to increase engagement with OEP.

2.3. Cox and Trotter's (2017b) OER adoption pyramid

As reported in my literature review in chapter 3, it is common to find lists of barriers and enablers to OER engagement by tertiary education institutions, as highlighted by Cox and Trotter (2017b).

Researchers often compile barriers and enablers into lists in no particular order (Cox & Trotter, 2017b). Cox and Trotter similarly identified barriers to OER adoption. However, they realized that, rather than creating lists of OER barriers as equivocal items, they could organize them. The barriers could be categorized according to the amount of control that an individual faculty member had over them, noting that the faculty's respective institutions held the balance of that power. Cox and Trotter defined six categories that formed a layered pyramid. The bottom layer corresponded to the category where the institution held the most power (externally determined) and the top layer corresponded to the category where the lecturer held the most power (internally determined) (Figure 2.2.). The six categories, starting from the bottom of the Pyramid, were: "infrastructure access, legal permission, conceptual awareness, technical capacity, educational resource availability and personal volition" (Cox and Trotter, 2017a, p. 300). The Pyramid is concerned only with barriers or factors that affect whether or not OER are adopted. Influences that affect how OER are adopted are called "variables" and are excluded (Cox and Trotter, 2017b). While the Pyramid was used to organize OER barriers, I have extended its use to include stress for engaging with the OERu (which are specific OEP) and stressors related to implementing OEP at IIIU and EEEU. The stressors that pertain to OEP are indicated with an asterisk in Chapters 6 and 7.

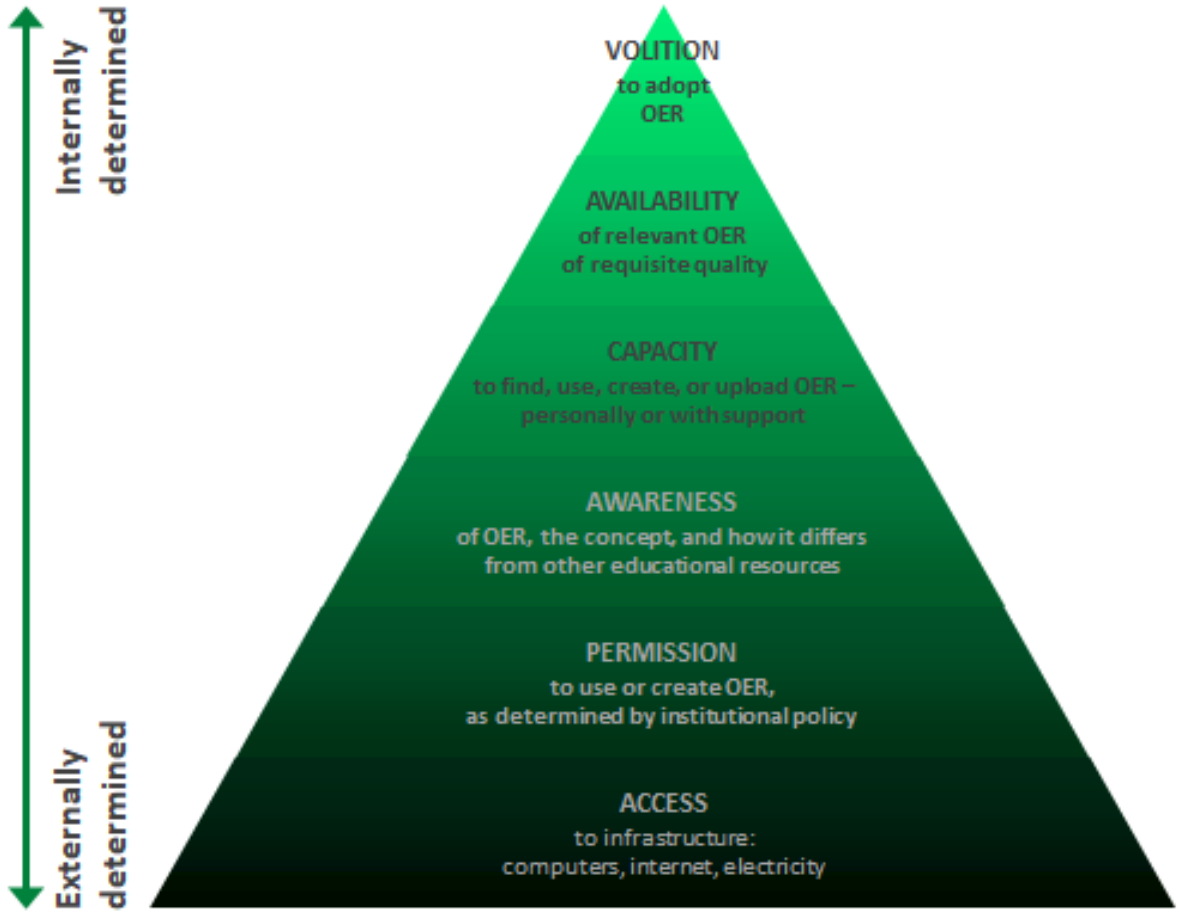

Figure 2.2. OER adoption pyramid (adapted from Cox and Trotter, 2017a; CC-BY)

In order to use the Pyramid in a way that was coherent with my study, I converted the concepts of enablers and barriers to that of stressors to align my interpretation of the findings with the Arena framework. This means that stressors can be seen as having the characteristics of both barriers and enablers, though they can also act as either a barrier or an enabler. In other words, the stressors can influence the system positively, negatively, or a combination thereof. For example, funding for an OER project may at first seem like an enabler, but conditions that may accompany the funds can be inhibiting. In examining my findings, I sought stressors that were described as such explicitly or that were alluded to implicitly. The important point to consider is that both the opportunities and challenges inherent in a given stressor stimulate evolution. Enablers can encourage species to innovate in ways that were previously constrained whereas inhibitors can stimulate species to think

creatively in moving forward with an educational technology. Thus, stressors have a dual identity of barrier and enabler for promoting evolution.

Cox and Trotter (2016) analyzed organizational culture to examine how OER are used. They found that culture influenced OER adoption through the interplay of social, institutional, and individual forces. The relationships among these forces are categorized at the highest level of the Pyramid and are represented in Figure 2.3.

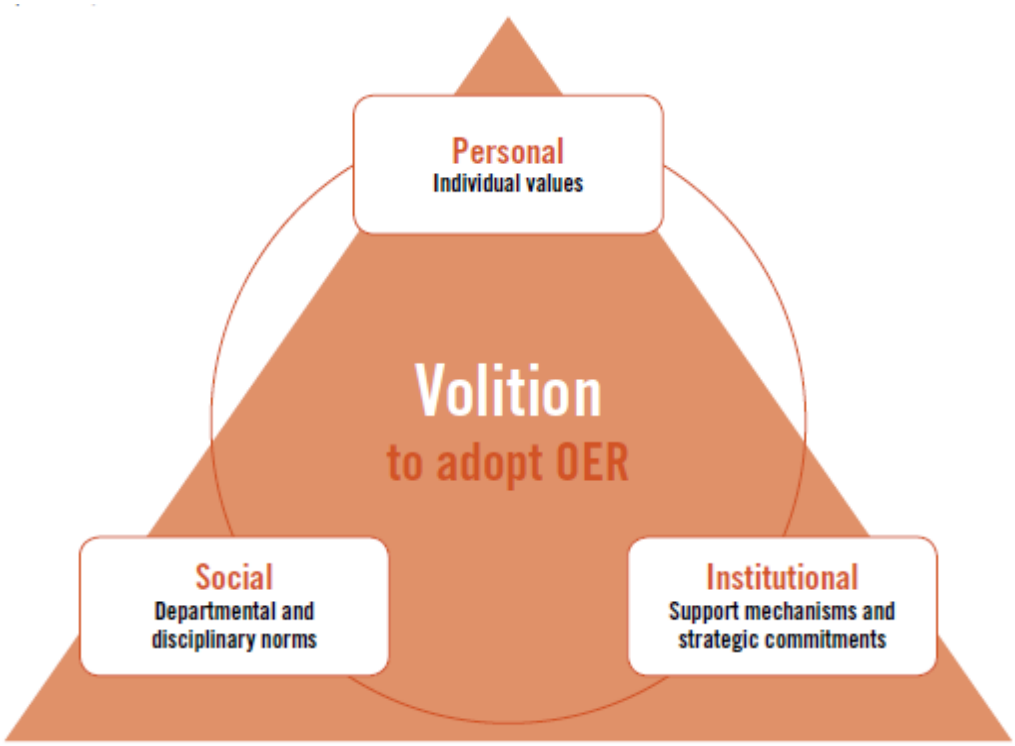

Figure 2.3. The final factor of the OER adoption pyramid – volition (Cox & Trotter, 2017a, p. 303; CC-BY)

Organizational cultures were a consideration in the current research, but in a different way than in Cox and Trotter's work. Cox and Trotter combined two frameworks (Bergquist & Pawlak, 2008; McNay 1995) to analyze organizational cultures. The current research was planned before Cox and Trotter's works were published (2016, 2017a, 2017b), and frameworks on the topic of organisational culture had already been selected (Cameron & Quinn, 2011; Schein & Schein, 2016). The next section explains how organizational culture was explored in this research. Before exploring the topic

of organizational cultures, I will summarize a study that used the Pyramid as a framework for analyzing findings.

The study examined OER adoption at a Dutch university (Baas, Admiraal, & van den Berg, 2019). The authors aimed to determine how OER were being used. To this end, they conducted a survey with 143 respondents and semi-structured interviews with 11 participants. The findings allowed the authors to uncover ways that teachers could be supported in OER adoption. The findings were categorized according to the categories of awareness, availability, capacity, and volition. The authors found areas where teachers would benefit from support and made several recommendations. Among the recommendations were to have librarians perform searches of OER to select and curate them. Another recommendation was to develop policy for supporting OER engagement by building it into current practices and by supporting collaborations with support staff such as librarians and instructional designers. A final recommendation was to integrate OER training into professional development for new hires. The authors also suggested that the OER adoption pyramid might be adapted to suit different circumstances. For their participants, whose awareness of OER was low, the suggestion was to place the "availability" category below the "capacity" category. The reasoning was that finding OER was the greatest barrier to OER engagement. Once the OER were made available to the teachers, they were then in a position to build capacity to use them.

Studies examining OER engagement and how it is influenced by organizational culture

There is a paucity of research focused on OER engagement, instructional design, and organizational culture. However, two studies emanating from South Africa and the United Kingdom, respectively, explored the relationship between OER engagement and organizational culture. The first study occurred in two parts (Cox & Trotter, 2016 , 2017b). The first part examined the influence of organizational culture on OER engagement. The second part examined the barriers to OER engagement in South African tertiary education. The second study examined different ways of

engaging with OER (Coughlan, Pitt, & Farrow, 2019) and considered the impact of organizational culture.

Cox and Trotter (2016) began their study with a view to determining whether institutional policies enabled OER engagement, and if so, how: as a hygienic factor (offering structural support) or as a motivating factor (with incentives). The authors hypothesized that organizational culture influenced how policies affected OER engagement. They characterized organizations according to how tightly they defined and implemented policies (McNay, 1995). To account for broader aspects of culture, they also used an approach for describing organizational culture based on the governance style, the amount of autonomy individuals had, and where individuals worked (on site or at a distance) (Bergquist & Pawlak, 2008). Data collection involved interviews with six people each from three South African universities. The interviewees were selected from among participants who had attended professional development workshops about OER delivered by the researchers. The first author of this article also drew from data collected from 14 interviews in her PhD research (Cox & Trotter, 2016). The authors examined the impact of institutional policy on OER engagement. They examined hygienic factors that provided conditions supporting OER engagement. They also examined motivating factors that provided incentives to engage with OER. The findings led the authors to conclude that a policy on intellectual property rights favoring OER engagement by faculty members should be both hygienic and motivating to lead to sustainable OER activity. Additionally, OER advocates were recommended to use varied approaches customized for a given institution, particularly in the Global South where support structures were considered weaker than in the Global North (Cox & Trotter, 2016).

Cox and Trotter (2017b) built on this research to examine the barriers to OER engagement in South Africa. To contextualize their research, they reported extensive findings from the literature about barriers to OER engagement in the Global North and Global South. These regions were distinguished

by their resource capacity and technological infrastructure. The authors aimed to identify reasons that South African lecturers chose to adopt OER or not and the influences on this decision. They also wanted to better understand the influence of organizational culture on OER engagement. Additionally, they were interested in organizing the barriers in a framework to make better sense of them by examining factors that were strictly required for OER engagement and purposely ignoring variables which influenced how faculty used OER (Cox and Trotter, 2017b). This approach was intended to allow for clear comparisons of OER engagement between institutions. Cox and Trotter developed the OER adoption pyramid and identified six factors that formed its hierarchical structure to classify barriers and enablers to OER engagement in tertiary education institutions. They further analyzed the findings by developing OER readiness tables to compare the three institutions in terms of the six factors to determine the ways in which they could engage with OER.

This research showed that it is only when all of the six enabling factors of the OER adoption pyramid were addressed that organizational culture influenced whether an individual would engage with OER. However, OER engagement could occur in isolation as well, independently of social and institutional influences (Cox & Trotter, 2017b). Further, none of the three types of organizational culture in this study appeared to favor or inhibit OER engagement. For each type of organizational culture that they had characterized, Cox and Trotter suggested that OER adoption be planned based on the roles and structures most likely to support it. What strongly influenced lecturers to use OER was not their openness, but their suitability, quality, and practicality for a given purpose, just as with any other educational resource.

While Cox and Trotter examined the influences on OER engagement, Coughlan, Pitt, and Farrow (2019) explored what occurred after an OER innovation had been implemented. This research was based on the premise that innovations take time for their enablers and obstacles to appear and for results to form and have an impact. Coughlan et al. (2019) thus conducted a qualitative longitudinal

case study where they interviewed 20 participants from 7 organizations individually and in focus groups. These people had engaged with OER from the *Bridge to Success* program which was for adults preparing to make the transition to tertiary education. They were questioned about how they had used OER (as primary instructional material, secondary material, or other possibilities). There were also 38 interviews about the development of OER and how they were used early on.

The authors found that there were three forms of OER engagement by their participants, and they examined them using Rogers' Diffusion of Innovations model (Rogers, 2003) to examine how these forms of OER engagement occurred. The first was specific adoption, which involved a single user who provided OER as supplemental materials for a course. The second form of OER engagement was preferred practice, which referred to individuals or organizations that regularly sought out OER for their courses. The third form of engagement was "foundations for innovation". This type referred to OER engagement as a basis for implementing new instructional practices such as blended learning, or adding on activities, assessments, and accreditation. The authors explained how these processes were related and provided an analysis of enablers and barriers in going from one process to another. The authors noted that Rogers' framework did not capture the complexity involved in OER engagement. Consequently, they called for a more nuanced method that might account for various individual and organizational practices as well as sustainability and changes in the OER that are used in instruction. They also recognized the value of organizational culture in innovation with OER.

2.4. Schein and Schein's (2016) Three layers of organizational culture and Cameron and Quinn's (2011) Competing values framework

Schein and Schein (2016) define culture in this way:

> The culture of a group can be defined as the accumulated shared learning of that group as it solves its problems of [adapting to external conditions and integration of internal processes] which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, feel, and behave in relation to those problems. This accumulated learning is a pattern or system of beliefs, values, and behavioral norms that come to be taken for granted as basic assumptions and eventually drop out of awareness (p. 6).

This quote is significant in describing how culture is developed over time and experience, and how it is shaped by the initial conditions that a group encounters. It also implies that people who were group members from the start have a lived experience of at least some of the events that shaped the culture. This lived experience is valuable even when it is later forgotten as certain forms of learning become basic assumptions. Outsiders and people who have newly joined an organization will not immediately understand its culture. Their first encounters will be with objects, documents, and behaviors that are immediately observable. With time and exposure to a group's ways of working, deeper layers can be discovered. Schein and Schein (2016) have categorized the layers of organizational culture.

In their view, an organization's culture is structured into three layers, from the most easily observable to an outsider, to the least visible. The first layer consists of artefacts (customs, published values…). While they are easily visible, it is difficult to make sense of them (Schein, 1990b). To interpret the meaning of artefacts requires an understanding of the underlying assumptions that they are linked to (Schein, 1990a). It also requires an understanding of the challenges that were overcome to develop the underlying assumptions (Schein, 1990a). The second, deeper layer consists of espoused beliefs and values (stated beliefs about how things should be). These beliefs and values are revealed when one asks why a particular action is habitually taken. For example, upon asking why an office space consists of an open plan, an employee might respond that it is in that form based on the belief that it favors spontaneous interactions among staff members. Such values and beliefs are manifestations of organizational culture, whereas the third level corresponds to the essence of organizational culture (Schein, 1990b). The third and least visible layer consists of basic underlying assumptions (beliefs that have led to consistently successful results and became underlying assumptions about how the group or organization is productive). These assumptions are considered to be unquestionable; they were arrived at by overcoming challenges and have since become implicit (Schein, 1990b).

According to Schein, (1990b), the culture of a group is in its early stages of development when it is dominated by its founder. The culture evolves as it expands through its mid-life until it arrives at a mature stage where the culture is perceived as a constraint to change. The organizational culture strengthens as a group stabilizes and ages, and as the leader of a group strengthens her or his assumptions (Schein, 1990a). The culture also strengthens with the quality and potency of the group's learning experiences in solving problems based on the external environment and internal integration. The following framework relates to the second of Schein and Schein's three layers.

According to Cameron and Quinn (2011), an essential component to success in organizational change is organizational culture. With the aim of assessing organizational cultures, these authors developed the Competing values framework. It is based on research on the values associated with organizational effectiveness. The identified values were organized into two dimensions of a framework. One dimension represents a continuum of types of organizational focus ranging from internal focus characterized by integration, unity, cohesion, and consonance to external focus characterized by differentiation, rivalry, separation, and independence (Cameron & Quinn, 2011). The other dimension represents a continuum of organizational preferences for structure ranging from stability, control, steadiness, and durability to flexibility, change, discretion, versatility, and pliability (Cameron & Quinn, 2011). By intersecting the two dimensions, we obtain four quadrants which each correspond to a culture: Clan, Adhocracy, Hierarchy, and Market as shown in Figure 2.4.

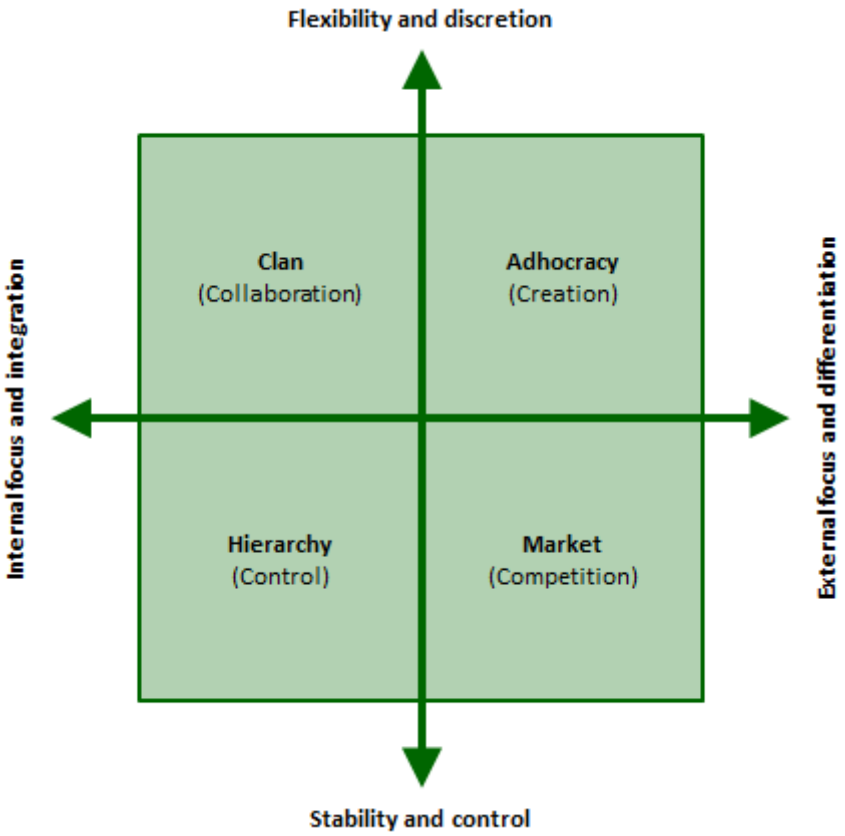

Figure 2.4. The Competing values framework (adapted from Cameron & Quinn, 2011, p. 39)

Characteristics associated with Hierarchy are: regulation, order, indifference, formal, bureaucratic, responsibility (Cameron & Quinn, 2011). The aim of hierarchies is efficiency, consistency, coordination of tasks, and control of employees and their time management. The means for developing Hierarchy as a dominant organizational culture are to have an authoritarian leadership with accountability measures and formal policies and procedures (Cameron & Quinn, 2011). The Market refers to how the organization acts: as a market concerned with transactions with external agents like customers, regulators, and contractors. In contrast to a Hierarchy, the rules are a function of external forces related to the market, financial transactions, and competitors' behaviors (Cameron & Quinn, 2011). Consequently, organizations with a dominant Market culture interact with external organizations through exchanges, sales, and agreements with the goal of increasing profits, market share, and a loyal customer base. The Clan is characterized by harmony, active involvement, common values, and compassion (Cameron & Quinn, 2011). In organizations where the

Clan dominates, employees are encouraged to be friendly with and learn from each other, are empowered and offered professional development, and their opinions are valued and solicited. The Adhocracy is shaped by innovation, a view to the future, creativity, and pioneering work (Cameron & Quinn, 2011). Organizations with a dominant adhocracy culture adapt quickly as circumstances and opportunities change, which requires creativity, the will to take risks, and an ability to anticipate future threats and opportunities.

When referring to Cameron and Quinn's framework, researchers normally use the Organizational Culture Assessment Instrument (OCAI). It is a survey asking participants to assess the following points about their organizational cultures: Dominant characteristics, Organizational leadership, Management of employees, Organization glue, Strategic emphases, Criteria of success. For each point, there are four statements about the current organizational cultures, with each relating to one of the CVF cultures. Participants give each statement a value, and the four values for a given point must have a sum of 100. The process is repeated so that participants can attribute values to the statements according to what their preferred organizational cultures are.

The Competing values framework (CVF) has been used in studies in tertiary education. Chidambaranathan and Swarooprani (2015) used the CVF to determine whether there was a link between organizational cultures and six dimensions of knowledge management (knowledge creation, capture, organization, storage, dissemination, and application) and if so, whether the link represented enablement or inhibition. Daneshmandnia (2019) similarly used the CVF in combination with interviews to determine whether organizational cultures influenced information governance (including information security, and roles for managing records).

2.5. Role of the theoretical framework in this research

The theoretical framework shaped the study and gave perspectives on the findings that were relevant to the context and the problem. The Arena was used to increase the understanding of

complex relationships within and across ecosystems and sectors regarding forms of OEP implementation and their role in supporting OER engagement. The Arena also helped to determine processes that were sustainable and ways in which the institutions had evolved technologically and educationally. The Pyramid was used to organize the OER stressors into hierarchical categories. The categorization process in the analysis led to a greater understanding of the stresses and their effects on the roles, matter, and processes pertaining to OER engagement and OERP implementation. The use of the Pyramid to extend the Arena aimed to situate the stressors in the Arena diagrams to identify roles and matter that were most closely linked to them, and which sectors to which they corresponded. The result was an increased understanding of how species, matter and stressors affect each other in a complex and holistic system. The role of the organizational culture frameworks was to enrich the contextual description of the institutions and reveal indications of the espoused values and their influence on OER engagement and OEP implementation. The frameworks, the subjects that they are used to analyze, and their respective purposes in my research are summarised in Table 2.1. They are further explained below.

Table 2.1. Use of frameworks in the analysis of the findings

Framework	Subject under analysis	Purpose
Davis' (2018) Arena	Course design and development - and delivery by the OERu only (LiDA103)	Examine OEPs of OERu course design, development, and delivery to examine interactions across the system Determine ways in which ecosystems are sustainable Describe ways in which ecosystems can evolve or where education and technology can co-evolve Map living and non-living matter onto an Arena diagram to gain an understanding of how they interact with each other when implementing OEPs
Cox and Trotter's (2017b) OER adoption pyramid	Barriers and enablers (stressors) to OER engagement	Categorize the stressors related to OER engagement and OEP implementation to gain an understanding of their influence and to stimulate thinking about planning for further open education innovation
Davis' (2018) Arena	Barriers and enablers (stressors) to OER engagement	Map the stressors onto diagrams and tables to gain an understanding of their influence on the system and on OEP implementation Describe ways in which the system can evolve and co-evolve with the stressors

Davis' (2018) Arena	OERu's OEPs for the general organizational operations, including data based on Rory McGreal's perspective and Wanda's anecdote IIIU's and EEEU's OEPs for providing educational options to its students	Examine OEPs of using open source software, open philanthropy, open communication to gain knowledge of how the OERu functions Brief examination of IIIU and EEEU in terms of OEPs for increasing access to education to increase understanding of the institutions' profile and history
Typology and language of Cameron and Quinn's (2011) Competing values framework	Indications of organizational culture at the Schein and Schein's (2016) second level	Use typology and language for coding findings about the OERu, IIIU, and EEEU to uncover indications of its organizational cultures at the second level.

To use the Arena, I first needed to collect data about each institution's system at each level as they related to OER engagement and OEP implementation. From interviews, observations of videos, and document analysis, I gathered information, which I synthesized and organized according to the Arena's layers and sectors. In placing symbols for the matter on the diagram, I had to make choices about their location. This thought process helped to clarify the nature of the species and non-living matter. I identified and described salient relationships and interactions as well as keystone species. The Arena framework accounts for cultures in a classroom, which include the national cultures and behavioral patterns of all species in the course ecosystem (Davis, 2018). However, in the OERu course, there were too few postings and interactions to learn about the cultures. With respect to IIIU and EEEU, the courses were not delivered, so I could not examine the cultures in their ecosystems.

During my data collection process, and particularly during the interviews, I collected data about enablers and barriers to OER engagement. I reconceptualized the barriers and enablers as stressors, and I applied the categorization system of the OER adoption pyramid to the stressors and plotted them on an Arena. The categorization process had to be repeated several times for some stressors as their meaning became clearer. I also had to make decisions about where to place stressors that could have been placed in two categories. The resulting conceptual framework allowed for the analysis of tertiary education systems along with stressors.

To apply the Arena framework extended by the Pyramid, I mapped the stressors according to their ecosystem level and their sector. As with previous mapping and categorization of items, the mapping of the stressors took some thought and several iterations of positioning, repositioning, analysis and re-analysis. I found patterns in the stressors and questioned how they came to be. I also questioned why other stressors showed no patterns or patterns that were less apparent. The questioning and re-mapping continued until the findings could be written coherently.

According to Schein (1990a), there are particular forms of research suited to each layer of organizational culture. For the artefact level, it is a matter of observing artefacts found in the organizational space as well as documents such as records, reports, strategic plans, etc. However, observation alone does not suffice to make meaning out of artefacts. To do so requires an understanding of the underlying assumptions and how these assumptions came to be when overcoming challenges (Schein, 1990b). Without such knowledge, a researcher cannot explain why or how members of the organization behave in response to the artefacts. To collect data regarding the second layer of organizational culture, Schein (1990a) recommends conducting interviews and using surveys to gain an understanding of customs, beliefs, and philosophies, among others and why particular values or beliefs exist. To examine the deepest layer of organizational culture – underlying assumptions – one should conduct more intensive interviews and lengthy observations and ask participants to analyze their own behaviors and beliefs (Schein, 1990).

I limited my research to the two first layers, because an examination related to the third layer would have required more resources and time than were available for the completion of this research. I had access to planning documents, statements of the vision and mission, and documentation related to the services offered. Findings based on artefacts were used to describe the organizations and their context. The first layer of Schein and Schein's (20 16) framework also involved an examination

of the organizational space and the physical artefacts therein. However, it was not possible for me to visit each institution to conduct such an examination. For the same reason, I did not conduct an examination that would have allowed me to make sense of underlying assumptions; they would have helped to make sense of the artifacts. As a consequence, the artefacts were interpreted through my reaction to and my understanding of them. This is in opposition to having an understanding of the artefacts in light of underlying assumptions. Knowledge of the underlying assumptions would have allowed me to interpret the artefacts from the participants' perspectives and provide richer details of their significance. I would also have been better able to describe the influence of the organizational cultures on OER engagement and OEP implementation.

For the second layer, it would have been relevant to use the OCAI (Cameron & Quinn, 2011). However, I did not use it because I did not have enough participants. Additionally, some participants were not willing to have the OCAI used on a large scale in their organization. Instead, I interviewed participants and collected data about stated philosophies and values. I coded these findings using the typology and vocabulary and categorized them according to the four value-based categories of the CVF (e.g. Clan). The result was to obtain indications of the types of cultures that were present and dominant in different ways (e.g., for course developers, for administrators) at each institution. To illustrate, terms used by interviewees or processes described in online documents were matched against vocabulary associated with the four CVF quadrants and categorized accordingly. I also suggested how the organizational cultures might influence OEP implementation.

2.6. Conclusion

The theoretical framework used in this research involves Davis' (2018) Arena. It applies an ecological lens and is used to gain an understanding of interactions within a system in an educational context as changes occur with digital technology. A diagram of an Arena represents a situation at a given moment and must be accompanied by a description to make sense of the activities occurring within the system over time. In an educational system where one is attempting to create change with

digital technologies to engage with OER, stressors will be encountered. The stressors can be examined with the lens of the Arena to make sense of how they impact ecosystems and species. They can also be organized by using Cox & Trotter's (2017b) OER adoption pyramid. The pyramid helps to gain an understanding of the stressors by organising them into hierarchical categories. The categories have been defined according to the amount of control is exerted over the stressors by the institution or the faculty (and in my research, course designers and administrators too). This framework helps to understand the nature of the different stressors and informs how to respond accordingly. Schein and Schein's (2016) Three layers of organizational culture and Cameron and Quinn's (2011) Competing values framework were applied to gain an understanding of indicators of organizational culture. Schein and Schein's framework categorizes organizational culture into three layers, from the most to least obvious. Cameron and Quinn's framework enables one to label and sort an organization's cultures according to four categories of values.

Chapter 3. Literature review

This chapter begins with an explanation of the methodology I used to conduct my literature review to find gaps related to my study (section 3.1). The literature review contains an analysis of literature reviews on the topic of distance education from 2000 to 2013 (section 3.2). This literature was explored to situate research on OER and OEP in a broader context. The chapter continues with a summary of literature reviews on OER and OEP (section 3.3). Empirical studies will be discussed in terms of how open educational practices have been applied (section 3.4). This research was reviewed to illustrate how my study fits in this field, and to explain how this literature review informed my research (section 3.5). The chapter concludes with an overview of New Zealand's initiatives to support openness and open education (section 3.6).

3.1. Methodology used in the literature review

To locate the studies discussed in this chapter, I performed a systematic search using the online library search tools at the University of Canterbury. More specifically, I used the "Education Research Complete" and "ERIC" databases, and I used a time span of 2010-2019 since the topic of open educational practices was not common before 2010, as per the literature reviews above. I used key words from this set: research, case study, ethnographic, instructional design, learning design, qualitative, study, and interview. I combined them with each of these terms: Open Educational Practices, OEP, Open Educational Resources, and OER. I selected 17 articles to review based on the titles, the abstracts, and a brief reading of the articles. Appendix 1 contains a table of the initial analysis of the empirical studies to find gaps in the research. There are more studies listed in the table than are discussed in this chapter. This approach is taken for the sake of brevity.

The remainder of the literature was obtained through searches for sources, for example, on a variety of specific topics (e.g., OER or OEP in New Zealand), by specific authors, or about research methods and techniques. These searches were conducted in "Education Research Complete" (which later became "Education source"). "ERIC" databases, "DOAJ", http://openedgroup.org/review,

http://oerhub.net/research-outputs/publications/, https://oerknowledgecloud.org/, and Google Scholar. I consulted handbooks and similar collections related to my topic. The following ones are those that contained at least one article relevant to my research: Handbook of Distance Education, Handbook of Research on Educational Communications and Technology, Handbook of Research on Instructional Systems and Technology (Vol. 1 and 2), Instructional-Design Theories and Models: A New Paradigm of Instructional Theory, Contemporary Perspectives in e-learning Research, e-Learning Reader, Sage Handbook of E-Learning Research, the International Encyclopedia of Education, Open and distance education theory revisited: Implications for the digital era, and Encyclopedia of Educational Philosophy and Theory: Living Edition. In addition, I have been receiving Google Scholar Alerts on the topic of "open educational practices" since early 2015. I also received links to articles and other resources on the topic of open education from the following mailing list: https://lists.okfn.org/mailman/listinfo/open-education. I searched for articles using social media. Some resources were already a part of my personal collection when I began this work, and others were suggested to me by my supervisors.

3.2. The state of research on distance education from 2000-2013

Zawacki-Richter, Bäcker, and Vogt (2009) conducted a literature review on distance education research, examining 695 articles published from 2000 to 2008 in the five most prominent journals in that area, including journals on open education. The purpose was to identify research gaps and priority areas. The articles were grouped into 15 categories using a coding system that applied analytical methods to increase the review's reliability. The authors reported that instructional design and educational technology (including OER, which was mentioned briefly) were consistently popular topics throughout 2000-2008. Also, research on innovation was lacking, and there was a demand for qualitative research. Building on the work of Zawacki-Richter et al., 2009, Bozkurt et al. (2015) conducted a broader literature analysis for 2009-2013 using the same 15 categories. However, Bozkurt et al. (2015) included two additional journals and conducted more analyses, possibly due to the availability of more advanced techniques and technologies. The methods for reviewing and

coding the articles were measured by the authors as reliable (Bozkurt et al., 2015) and data were reported rigorously. Their findings included a continued high rate of publication about educational technology and instructional design. OER had the greatest number of hits among selected terms, and "instructional design" was ranked the sixth most common term. However, "open educational practices" were never mentioned, indicating the rarity of this term. Qualitative research comprised approximately half of the research methods and was declining. Case studies comprised 66% of research designs. Among the types of participants, faculty were 10%, and administrators, 4%. This means that my own research, aside from case study work, would fill a gap in terms of research methods combined with the type of research subject.

3.3. Literature reviews and a meta-analysis on open education, OER, and OEP

Several literature reviews and a meta-analysis have been conducted on different aspects of OER and OEP with varying methods and aims. Wiley, Bliss, and McEwen (2014) conducted a literature review as an overview of research aiming to define terms such as "OER," "open," and "CC licenses." They also examined how to develop and share OER, and the advantages and disadvantages of OER. Wiley is widely known globally in the OER community. Lesser-known authors conducted a similarly themed literature review of a much smaller scope (Al Abri & Dabbagh, 2018), effectively updating the literature by Wiley et al. They outlined the emergence of OER and examined ten empirical OER studies pertaining to K-12 and tertiary education. They revealed slow progress and a broadening of research interests in OER since Wiley et al.'s (2014) review. A meta-analysis of OER adoption in 25 German institutions at various education levels was conducted by Otto (2019). His aim was to compile the lessons learned regarding OER adoption and provide recommendations for the design and adaptation of OER. Two more literature reviews reduced the emphasis on OER and increased emphasis on OEP. The first was by Bozkurt, Koseoglu, and Singh (2018), who analyzed literature to determine trends regarding publications including terms related to open education. The second, by Cronin and MacLaren (2018), examined OER and OEP; changing perceptions of OEP; and definitions

of OEP focusing on teaching and learning practices, open scholarship, open pedagogy, and open teaching.

In their reviews of OER, Wiley et al. (2014) and Al Abri and Dabbagh (2018) noted benefits of OER such as lower costs for students but did not identify clear pedagogical benefit to using OER. Hilton (2016) made similar conclusions in his literature review on open textbooks. Otto (2019) observed that increased awareness of OER associated with self-directed learning was beneficial in that it exposed instructors to forms of learning that were new to them. Al Abri and Dabbagh (2018) found additional benefits: the adaptability of OER and their potential to foster engagement in OER communities which resulted in increased trust in OER use. They also found that, to take greater advantage of OER, it is important to consider open pedagogy and its role among other forms of pedagogy; OER engagement in open environments will not necessarily be the best approach in every learning situation. According to the revised Bloom's taxonomy, the task of creation represents the highest level of thinking (L. W. Anderson & Krathwohl, 2001). Other forms of pedagogy can be used for tasks associated with the other levels of thinking. Thus, faculty can think of how different pedagogies or learning theories work together within a system when designing and developing a course or a full program.

Al Abri and Dabbagh (2018), Otto (2019), and Wiley et al. (2018) also examined barriers to OER engagement. Barriers included the difficulty of discovering OER, poor curation of OER despite using rating systems and search tools, and the low perception of OER quality (Wiley et al., 2014; Al Abri and Dabbagh, 2018). Otto (2019) found resistance to OER was linked to concerns about legal issues and application of Creative Commons licenses. Al Abri and Dabbagh (2018) described further challenges such as providing feedback aimed at improving OER and of replacing OER with higher quality versions. Additionally, Wiley et al. found that repositories and referatories (sites that direct the searcher to desired OER) were difficult to sustainably maintain and fund. The reviews also

highlighted barriers of modifying or remixing OER due to low technological skills (Wiley et al., 2014) or poor knowledge regarding OER (Wiley et al., 2014; Al Abri and Dabbagh, 2018). Wiley et al. (2014) found barriers for course developers whose culture and language were poorly served by OER. These authors also described a barrier they called the remix problem, whereby the context of an OER is too unclear for others to use it.

Literature reviews were provided by Bozkurt et al. (2018) and Cronin and MacLaren (2018). Bozkurt et al. (2018) undertook lexical and social network analyses to examine the development of OER and OEP trends over time. Examples of analyzed topics are subject areas and country distribution. The research showed that studies on OEP started in 2007 and that articles containing at least one of the terms “open education”, “open learning”, “OER”, and “OEP” were published increasingly from 2009. The majority of the studies were conducted in developed countries. Cronin and MacLaren (2018) also noted a dominance of research on OER and open textbooks. Consequently, they examined empirical studies on OEP. They described foundational studies on OEP and changes that occurred in the literature since they were published, such as changing perceptions of openness. They indicated that some researchers viewed OER and OEP as being necessarily coupled, while others felt that OEP did not need to be rooted in OER. They found that open pedagogy was discussed in a similar way: it could be necessarily coupled with OER as in “OER-enabled pedagogy” (Wiley, 2017) or could take on broader meanings. An example of OER-enabled pedagogy consisted of students collaboratively or individually seeking out openly licensed materials, combining them, adapting the materials to a new context and adding their own creations, then publishing it online. The defining characteristics of OER-enabled pedagogy are the 5Rs. Out of these four literature reviews, none of them referred to instructional design processes of OER.

In reflecting on the literature in this section, a number of gaps were identified. Wiley et al. concluded that there were gaps in research regarding policies for OER and open assessment for

formative and summative assessment. Al Abri and Dabbagh (2018) called for research on perceptions of stakeholders who have worked with faculty on OER projects so that instructional designers can develop improved OER development processes. In addition, they suggested an increase in qualitative studies about the impact of OER on teaching and learning through pedagogies enabled by OER. Bozkurt et al.'s (2018) literature review showed that a common theme was barriers to OER engagement, and that there was insufficient research on OEPs. Bozkurt et al. (2018) observed a shift from research on developing OERs to research on implementing OEPs (a shift from Phase 1 to Phase 2 as per Ehlers (2011). Bozkurt et al. also indicated that there was a need for research on OEP. This work highlights a gap that the current research aims to fill. The gaps that Cronin and MacLaren found were in the research on diversity and inequality in open education as well as networked learning and connected learning in open education. This thesis endeavours to address these identified gaps by adopting a qualitative approach exploring the role of instructional design in particular in relation to OEPs and OER. It touches on networked and connected learning through open source social media tools used in the OERu's Next Generation Digital Learning Environment (NGDLE). A NGDLE is an open, integrated system of communication-enabling tools offered as an alternative to a LMS. An additional gap that these reviews did not address pertained to students' perceptions of learning in an open environment as indicated in the literature (Waycott, Sheard, Thompson, & Clerehan, 2013; Waycott, Thompson, Sheard, & Clerehan, 2017). This research will briefly explore this point by observing students in an openly licensed two-week course offered by the OERu.

Additional literature reviews on particular aspect of OERs such as reusability (Chiappe & Arias, 2015), open textbooks (Hilton, 2016), OER repositories (Atenas & Havemann, 2014; Clements, Pawlowski, & Manouselis, 2015) and the impact of projects in open development in lower- and middle income countries (Bentley & Chib, 2016) were considered. In addition, there are several guides published by UNESCO and the Commonwealth of Learning regarding the adoption of OERs in tertiary education

(Butcher & Hoosen, 2012; Glennie et al., 2012; Hoosen et al., 2016; Miao et al., 2016; UNESCO & COL, 2015) as well as other guides on similar topics from other publishers on open design (Bates, 2015; Conole, 2013), creating course templates to facilitate cultural adaptation of OERs (Wolfenden, Buckler, & Keraro, 2012), the use of CC licenses, (Hilton III, Wiley, Stein, & Johnson, 2010), Compendium LD, a tool for visualising open course design, (Conole et al., 2008) and Cloudworks, a site for sharing OERs and other resources (Conole & Wills, 2013). However, while the articles covered topics about OER and OEP, they did not focus on instructional design of OER. None of the guides or non-empirical studies provided a model for an integrated, holistic ensemble of practices supporting OER development.

3.4. Overview of the empirical literature

The topics covered in this overview are awareness of OER and motivations, barriers, and enablers to OER engagement; professional development on engaging with OER; and perceptions of OEP. Further studies are reviewed on the topic of the impact of organizational cultures on OER engagement and on the topic of ecological frameworks. Further, I provide a summary of the points that informed my research design.

Research on awareness of and engagement with OERs

Several studies have explored how OERs were used, which indicated the extent of OEP implementation. OER use in various institutions in international projects was described by Murphy (2013) and OPAL (2011). OER use or creation in a single institution was described by McKerlich, Ives, and McGreal (2013); De Hart, Chetty, and Archer (2015); and Rolfe (2012). There were two different approaches taken in the literature. For example, Murphy, OPAL, and Rolfe referred to open educational practices along with OER use, while McKerlich et al. (2013), De Hart et al. (2015) referred to OER use and creation without mentioning OEPs.

OPAL (2011) was the Open Education Quality Initiative which existed from 2010 to 2011 as an inter-organizational project that promoted a shift its focus from what it called Phase 1 (OER access) to

Phase 2 (the use of OER in the practice of teaching and learning or OEP). OPAL produced a non-peer-reviewed study consisting of a survey with 470 respondents, including policy makers, administrators, faculty members, and students from tertiary education institutions across Europe. The purpose of the survey was to investigate multiple perspectives of OER adoption and OEP implementation while advocating for their increased use as well as quality and innovation in OEP. Major relevant conclusions included the following: OERs were slow in being adopted because of a lack of supportive policies and institutional support; networks across institutions strongly supported OER-based initiatives; quality assurance was required for OER-based materials; Open Educational Practice implementation was successful in institutions that supported innovation, and OEPs in turn stimulated innovation such as instructional changes.

In a worldwide survey with 110 respondents Murphy (2013) examined the global progress in implementing OEPs while comparing member and non-member institutions of the OERu. This research consisted of a needs analysis within a larger ongoing project evaluation led by the OERu (OERu, 2014b). The respondents occupied a wide variety of roles (nearly half were lecturers, course designers, or in similar roles) at a variety of types of tertiary institutions. Universities made up 68% of the 83 institutions. Nineteen respondents were at member institutions of the OERu. Among the findings were a high awareness of OERs (78% of the respondents) high interest in OERs (92%) and high interest in the OERu (92%). These highly positive responses likely resulted from the recruitment method: most respondents were reached using mailing lists about OERs. However, there was low involvement in OEPs and less than 25% of respondents reported that their universities used or created OERs. Furthermore, members and non-members of the OERu did the following actions roughly equally frequently: create OERs, collaborate with other institutions to create OERs, and use OERs created by other institutions. However, OERu members were more likely to provide courses made entirely of OERs and were more interested in eventually providing assessment services for OER-based courses. The greatest barriers to implementing the OERu model or similar open

education projects, among a list of thirteen options, were the lack of available staff and volunteers, the cost of redeveloping courses, and a lack of integration with existing work processes. These barriers were similar to the most common barriers reported by OPAL (2011), "1) Lack of institutional support; 2) Lack of technological tools; 3) Lack of skills and time of users; 4) Lack of quality or fitness of OER; 5) Personal issues (lack of trust and time)" (2011, p. 8). To overcome these barriers, Murphy (2013) recommended that tertiary education institutions provide leadership for integrating open educational practices into their policies and that they dedicate funds and human resources to open education initiatives within their institutions.

Murphy reported some limitations to her study, including the one mentioned about recruiting respondents largely using mailing lists about OERs. Other limitations were that the respondents were not necessarily aware of all the activities going on at their institutions regarding OERs, and a large proportion of the respondents - nearly half - were from the UK. A limitation not noted by Murphy was that she did not include "low quality of OER" among the response options in her question about barriers to using OERs. This occurred despite this barrier being known and reported earlier by OPAL (2011) as being among the top five barriers to OER use. For a worldwide study, a sample of 110 people seems to be small, especially when half of the respondents were from one country. This research would have been more credible with more respondents, if they were distributed roughly equally throughout the world, and if they had been recruited by targeting groups that didn't necessarily know about OERs. The findings could have also been made more credible by conducting interviews with a small portion of the respondents and by obtaining documentation on policies regarding OEP plans and implementation from the participants' institutions. Considering that the study was diverse on many levels (type of profession of the respondents, type of institution, geographical location) the findings were generalizable to a limited extent.

It is helpful that research similar to that of Murphy's (2013) has been carried out on a smaller scale, at different institutions by De Hart et al. (2015), McKerlich et al. (2013), and Rolfe (2012). Rolfe (2012) used a survey with 50 respondents (16% of the staff membership) from a UK-based university to explore awareness and attitudes related to OER. The survey was developed based on findings from preliminary semi-structured interviews with six members of staff from the same university. McKerlich et al. developed a 22-question anonymous survey that they called the OER Readiness Survey. It was the sole source of data in the study. It was used to collect self-reported data to determine the extent to which OERs were adopted and created by staff at Athabasca University and to determine their attitudes towards OER. A second purpose of this research was to pilot the survey for measuring adoption of OERs so that it could be used for similar research in the future. These authors obtained 154 responses out of approximately 1300 staff members at Athabasca University. One of the authors, McGreal, had been a major proponent of OER and in 2013 became a UNESCO/COL Chair of OER. Thus, this research was informed by experience and awareness of global OER issues.

De Hart et al. (2015) conducted research that was similar to, though more rigorous, than that of McKerlich et al. De Hart et al. used a survey containing both closed-ended and open-ended questions to examine the awareness, use, and creation of OERs by staff at the University of South Africa (UNISA), knowledge about copyright and open licenses, barriers to OER use, and OEP implementation. The construction of some questions tested whether the participants understood what OERs were by having to prove it, rather than using the less rigorous self-reporting of McKerlich et al. In addition, De Hart et al. (2015) used Rogers' (2003) *Five stages of the innovation adoption process* as a way to describe the extent of OER use at UNISA. De Hart et al. also provided a lengthy description of UNISA's context, while McKerlich et al. did not. This information is available elsewhere (Ives & Pringle, 2013; Kennepohl, Ives, & Stewart, 2012; Rory McGreal, Anderson, & Conrad, 2015).

Based on Rolfe's (2012) survey, nine respondents were aware of OER and a similar number were aware of repositories for OER. Staff felt comfortable borrowing resources and sharing resources with colleagues - but not with a wider audience. McKerlich et al.'s survey revealed that 41% of the 154 respondents used OERs, and 37% created OERs. Similarly, De Hart et al. (2015) found that a high percentage of respondents were active in categories of OER use: accessing OER (74,1% of their 483 respondents), redistribution of OER (49,9%), re-using OER (49,9%), and contribution to the OER community: revision of OER (35,0%), remixing OER (36,7%), and developing new OER (31,0%). Similar to Murphy (2013), McKerlich et al. cautioned that their results should be interpreted knowing that the 154 respondents were likely to know more about OERs than the remainder of the total population of 1300 people of their study. De Hart et al. did not report any limitations, so no bias was revealed. Still, the evidence was not strong enough for the values of OER to be taken as representative of the entire institution in either study.

In terms of the factors considered to increase or lower barriers to OER use, McKerlich et al (2013) found that recognition was the least important motivator for using OER. The authors attempted to explain this finding by supposing that OER users were intrinsically motivated or that they didn't expect recognition for OER use. The authors saw intrinsic motivation as an emotional attachment to OER. Brief interviews with respondents might have helped to reveal their motivations. In contrast to McKerlich et al.'s findings regarding motivation, De Hart et al. found that a lack of incentives and recognition valuable for promotions were barriers to OER use and creation.

Rolfe's (2012) survey revealed that barriers to OER engagement included concerns about job security, formal recognition for OER production, and low confidence in skills for engaging with OER. McKerlich et al. (2013) found that respondents would be most likely to use and create OERs if the following factors, presented in decreasing order of importance, were addressed: academic quality; having time to find, review, and select OER; having greater knowledge about OER, and having

support for course creation teams. The most important barriers as found by De Hart et al. (2015) were, in decreasing order of importance, the lack of adequate ICT infrastructure (this study was done in a developing country), difficulty finding suitable or high quality OER, and concern about copyright, which was a specific concern regarding knowledge about OER, a barrier identified by McKerlich as indicated above. Concerns regarding OER quality were not necessarily founded since it was not clear whether all respondents in each study had used any particular method or framework to evaluate OERs.

According to Rolfe's (2012) survey, enablers to using OER were: IT and technical support; professional development about open licensing; and clarifying whether the university, the faculty, or the individual held intellectual property rights. For OER engagement to occur sustainably, Rolfe proposed that the university develop clear policies and provide professional development. She also emphasized the role of organizational culture in making sustainable changes. To enable OER adoption, McKerlich et al (2013) proposed enablers similar to those of Rolfe's, though they made no mention of organizational culture. They recommended that OER policies at the institutional level encourage and support faculty by implementing pro-OER policies and providing services (e.g., training and technical assistance) and infrastructure to support OER use. The authors also suggested that course development teams might focus on course assembly based on OERs rather than course development from scratch. The proposed solutions of De Hart et al. (2015) did not mention organizational culture either. Rather, they focused more on providing faculty with training than time. The training could cover skills in searching for OER in repositories and elsewhere, searching for high quality OER on the basis of criteria agreed upon by the university community of OER users, and on the evaluation of OER.

Professional development about OER engagement

In exploring engagement with OER and OEP, research about formal professional development (Karunanayaka, Naidu, Rajendra, & Ratnayake, 2015, 2017) and informal social learning (Schreurs et

al., 2014) is considered. Karunanayaka et al. (2015) indicated that they valued OER promotion but were interested in professional development for OER innovation and use where appropriate. To this end, they developed a holistic program. It was a program where participants learned not only about OER, where to find them, how to license them, and how to design them. They also learned how to integrate them in online education through open educational practices. These authors developed a highly structured six-month program and conducted a case study to examine how participants learned about OER engagement with questionnaires, a mapping exercise, analysis of discussion posts and self-reflections, and focus groups. The professional development (PD) program involved a variety of reflective tasks and discussion forums which may have been too numerous for the course time frame because some participants dropped out of the PD due to the workload. Participants reported that they needed more time to successfully complete higher-level thinking tasks. Of the 35 who began the PD, 10 finished it, and all reported enjoying it. Many participants reported that their self-confidence with regards to OER engagement had increased, and reflection and discussion activities enhanced the learning for those who had time to complete them. This study did not use a theoretical framework to examine the role of institutional policies and practices. Rather, it provided a richly detailed model for professional development on OER complete with a purposeful and engaging sequence of learning activities and examples of participants' work. The study included a summary of participant feedback for improving subsequent professional development programs. Though the authors did not refer to organizational culture, they highlighted some values by indicating the importance of the participants' enjoyment of the training.

The study above was followed by another with a focus on reflective practices and scenario-based learning (Karunanayaka et al., 2017) in PD that can be a model for others to adopt or adapt. The researchers found that the course's highly structured format with specific types of reflective practices at particular points enhanced reflection. This approach improved the participants' "critical thinking, creativity, collaborative learning as well as self-esteem, and helped promote a shift towards

open education practices" (Karunanayaka et al., 2017, p. 157). This quote is significant in that it revealed specific types of learning and personal development that occurred when using this type of professional development. Such findings about PD based on OER and OEP can help to design courses that are more effective and satisfying. They also demonstrated the type of work involved when tertiary education lecturers want to learn about OER so that they can engage with them.

A different approach to engagement was explored by Schreurs et al. (2014) who sought to learn about OEP and how people who implemented OEP collaborated and shared knowledge so that they could provide examples for organizations and individuals to use as models. Schreurs et al. suggested that sustainable OEPs were the result of strong collaborations among institutions and individuals. The authors conducted interviews with 3 people at each of 6 OEP initiatives and used a theoretical framework based on the concepts of communities of practice (Lave & Wenger, 1991), networks of practice (through inter-institutional interactions) and teams. The research showed that within a given initiative, interactions took on configurations varying in structure and formality. In addition, different configurations allowed for different types of learning. Social configurations within an institution were more formal and hierarchical, while more informal ones were self-directed. Additionally, networks of practice allowed for knowledge sharing that filled gaps in intra-institutional know-how which was valuable given the fast advancement of educational technology. Indeed, the inter-institutional interactions often stimulated changes in the use of technologies for sharing knowledge. Additionally, communities led by a coordinator through heavy interaction were more sustainable and effective. Further, communities that developed a shared identity and shared values regarding learning were more sustainable. In initiatives focused on OER development, a key element of productivity was the initiative shown by individuals (champions) along with institutional support. Schreurs et al. (2014) recommended that participants of online networks strengthen their community and enable learning by periodically meeting face-to-face and by developing trust, openness, and a sense of safety with each other. Thus, while they did not analyze organizational

culture, they did highlight actions beneficial for strengthening knowledge-sharing networks, which can inform initiatives desiring to engage with OER and OEP about the type of organizational culture to build. Further, these authors examined patterns of behavior and analyzed values that promoted collaboration.

Perceptions regarding OEP

In endeavouring to understand OEPs, I unpacked the findings of three studies, which explored the perceptions and models of OEP in tertiary education and the forms of knowledge that shaped the understanding of OEP. These studies explored how faculty learned how to engage with OER and OEP (Hood & Littlejohn, 2017; Kaatrakoski, Littlejohn, & Hood, 2017), the development of a model to stimulate thinking about instructors' roles when implementing OEP (Cronin 2017) and the development of a model for stimulating thinking to enable tertiary education faculty to shift towards OEP in meaningful ways (Paskevicius 2017).

Given the context that the OER community tended to focus on OER production and that the community was shifting from promoting OER access to implementing OEP as per Kaatrakoski et al. (2017), these authors sought to increase understanding of what OERs added to teaching and learning. This work was conducted in the context of the European Commission's prioritization of OER to adapt tertiary education to prepare students for ever-changing skill and knowledge requirements in society (Hood & Littlejohn, 2017). As in the study by Schreurs et al (2014), Kaatrakoski et al. (2017) recognized the role of both individuals and their institutions in OER and OEP engagement. Kaatrakoski et al. (2017) surveyed 521 European educators and used semi-structured interviews to follow up with 30 participants. Findings regarding how the participants engaged with OER and OEP indicated that they tended to implement their habitual practices rather than make use of the full opportunities that OER and OEP offered. In other words, there was a lag in the evolution of educational practices with respect to the technological evolution. This lag was exacerbated when the context did not support change, and the importance of organizational change in addressing this lag

was described as critical by the authors. Thus, Kaatrakoski et al. (2017) recommended that individuals and organizations evolve in lockstep. The authors also mentioned that individualism and cost-based decisions can hamper networked learning. This suggests that stronger values-based relationships among open educational practitioners in an institution should be fostered for the benefit of improved OER and OEP engagement and improved learning outcomes.

A different article based on the same research aimed to assess enablers and barriers to OER engagement for the purpose of guiding professional development and teaching and learning practices involving OER and OEP (Hood & Littlejohn, 2017). The authors used a model of integrative pedagogies (Tynjälä, 2008) to analyze the data from interviews with the same 30 people as mentioned above. These findings revealed conditions required for university educators to engage with OER and integrate their knowledge about OER into their practice. The conditions included opportunities to use a variety of knowledge types: reflection on theory and practice, application of learning to practice, and learning from colleagues and students. Some skills and knowledge were generalizable, and others had to be learned "on the job" in a given context. Hood et al. (2017) called for more research on this point and on OER engagement in various contexts (different levels and subject areas). The resulting findings were expected to improve instructors' learning process and innovations with regard to OER and OEP.

With an interest in filling a gap in research on open education, Cronin (2017) conducted research similar to that of Kaatrakoski et al. (2017) and Hood et al. (2017) but focused less on learning and knowledge sharing. Instead, the focus was on the meaning that tertiary education instructors derived from open educational practices and individual practice of implementing OEP while teaching. She examined if and how instructors applied OEP. If they did, she wanted to know how they contended with tensions they encountered in their practice. She also examined the influence of institutional structure and culture. Cronin conducted qualitative research including a case study with

interviews of 19 academic staff. She revealed that of the 8 who used OEP, they did so on a continuum of closed to open practices. Cronin found that,

> Overall, for the participants in this study, "using OEP" was primarily characterized by: having a well-developed open digital identity; using social media for personal and professional use, including teaching; using both a VLE [virtual learning environment] and open tools; using and reusing OER; valuing both privacy and openness; and accepting some porosity across personal-professional and staff-student boundaries. (p. 22).

This quote summarizes the tensions that instructors faced when implementing OEP such as choosing between personal and professional interactions, and choosing to share separate content with staff and students.

From these findings, Cronin constructed a model with four dimensions categorizing OEPs used by the participants and accounting for the tensions they experienced. The dimension of *Balancing privacy and openness* was interdependent with the dimension of *Developing digital literacies*. Additionally, the dimension of *Value social learning* was interdependent with the dimension of *Challenging traditional teaching role expectations*. The findings revealed the complexity of how OEPs were implemented depending on how the participants perceived them. For example, they constantly rethought their stance on privacy versus openness and their digital identity when using social media and similar communication tools. They were also influenced by social and discipline-based norms. This work aligned with Cox and Trotter's (2017b) work on OER; they found that institutional culture influenced individual decisions on how to engage with OEP. Cronin found that the participants thought about the costs (e.g., potential online bullying) versus the benefits (e.g., increased interaction with students) of engaging with OEP before deciding how they would engage with OEP.

The implications of this research are that professional development regarding OEP implementation for teaching and learning is complex and not simply a matter of developing skills in using CC licenses and ICTs in open online environments. Cronin concluded her study with a call for research on

individual experiences of implementing OEP. The findings of such studies may inform policy and practice and lead to more critical and theory-based examination of openness and open education. Cronin specifically called for tertiary education institutions to provide three types of support: "developing digital literacies and digital capabilities; supporting individuals in navigating tensions between privacy and openness; and, critically, reflecting on the role of tertiary education and our roles as educators and researchers in an increasingly open and networked society" (Cronin, 2017, p. 28). The two first points correspond with the Capability level of Cox and Trotter's Pyramid while the last point corresponds with the top level of the Pyramid (Volition) since it involves institutional influences on how an individual engages with OER and OEP.

While Cronin presented a model for thinking about the role of instructors in implementing OEPs, Paskevicius (2017) provided a model of constructive alignment. Paskevicius' aim was to stimulate faculty's thinking about applying OEP to instructional design. In turn, this thinking was hoped to facilitate a shift towards OEP. Paskevicius' purpose was to help instructors explore the possibilities available to them in engaging with OER and OEP to prepare students to function well and independently in an interconnected world. This work can enable a shift in power such that students have a stronger voice in deciding on learning outcomes, activities, and assessments. Paskevicius' model provided examples of OEP for the following components in an aligned fashion: learning outcomes, teaching and learning resources, teaching and learning activities, and assessment and evaluation. To support use of Paskevicius' (2017) model and facilitate OEP implementation, he recommended to focus on leadership and professional development on OEP implementation and to increase research on the possible impact of OEP on faculty and students. Examples of impact included developing digital literacy skills and increasing contact with community members who do not normally participate in tertiary education activities.

Paskevicius also explored the possibilities and limitations of developing OER in a LMS. He is the only researcher in this literature review to mention a LMS, and the importance of it lies in its implications for learning. The learning environment is relevant since the current research included an examination of course delivery in an open environment using a NGDLE. Paskevicius concluded by highlighting the potential of the model in provoking thought on developing meaningful teaching and learning with OEP.

Open and online learning

Two studies examined different aspects of open and online learning. I retained these studies with the aim of informing the analysis of my findings on the design and development of open courses. First, Dunlap and Lowenthal (2018) aimed to collect and curate recommendations from educators at various levels about effective practices for teaching online. Second, Bozkurt and Akbulut analysed dropout patterns of learners in a six-week long MOOC about open education. They associated the patterns with the learners' cultural contexts.

Dunlap & Lowenthal (2018) aimed to create a list of recommendations for online learning. They collected recommendations for this list through crowdsourcing from online educators during sessions at specific educational conferences. These educators had to have taught at least one course in the previous three years. Educators were recruited from a variety of disciplines. The intention was to create a list of recommendations for online learning that could be followed by any online educator. They categorised the recommendations into four lists: supporting student success, providing clarity and relevance, establishing presence, and being better prepared and more agile (Dunlap & Lowenthal, 2018). The recommendations and categories aligned with the Community of Inquiry model of online teaching, which the authors used as an indicator of the validity of their crowdsourcing method.

Bozkurt and Akbulut (2019) examined cultural contexts and dropout rates of 179learners in a six-week MOOC offered in late 2017. The authors categorised learners ad being in high-context cultures

(HCC) and low-context cultures (LCC). In comparison with LCC learners, their HCC counterparts tend to communicate more frequently through indirect and implicit messages, use non-verbal communication more frequently, and rely less on written communication, among other characteristics. They found that LCC learners tended to drop out of the MOOC at a lower rate than HCC learners. The findings suggested that LCC learners formed connections to other learners in fewer steps than HCC learners. Further, LCC learners had stronger and more frequent interactions across the network of learners. Thus, the authors recommended that instructors design courses to favour interactions among all learners. The findings showed that learners who did not interact (lurkers) dropped out at a high rate. Therefore, the authors recommended that instructors make greater efforts to welcome learners and to draw them into interactions more. The authors concluded by suggesting the implementation of universal design methods to increase the inclusion and participation of learners from diverse backgrounds. They also recommend providing learners with opportunities to adapt the course to their needs.

Dunlap & Lowenthal's (2018) findings were relevant more to online learning in traditional institutions, and offered a broad scope of detailed recommendations. Bozkurt and Akbulut (2019) had a more specific aim Recommendations from both studies are relevant to the current research since the structure of the courses developed at IIIU and EEEU are closely related to traditional online course offerings. All three courses in the current research are intended for open online learning for anyone with access to the internet. Thus, studies about retention based on culture can be helpful in informing such course designs.

3.5. Application of the literature to the proposed research

I wrote interview questions to determine how OEP are being implemented and what the barriers are to their implementation. Murphy's (2013) study had the questions that were most relevant to help in writing mine. In keeping with my interest in instructional design, I gave special attention to

practices related to course design and development informed by the research and theory described above. This literature review increased my awareness of common barriers and enablers to OER and OEP engagement in tertiary education. It also revealed how learning about OER and OEP can occur, which is relevant to my research in that the ecosystem of tertiary education institutions fosters a variety of ways of learning about open education. I discovered some influences and models of faculty engagement with OER and OEP based on perceptions of their roles and open education. Some studies revealed that organizational culture has an impact not on whether but how faculty engage with OER (Cox & Trotter, 2016, 2017a). These findings helped to frame my own research on organizational culture. Meanwhile, the study by Coughlan et al. (2019) showed that there was a need for frameworks for analyzing the complexity of innovation with OER; Davis' (2018) Arena seemed suited to the task. This review also revealed gaps in the literature such as a lack of research on instructional design processes of OER, a lack of ecological studies of OER and OEP in tertiary education, and a lack of studies regarding the influence of organizational culture on implementing OEPs.

3.6. The state of openness in New Zealand

The literature review would not be complete without an examination of what was published on the topic of New Zealand and its contribution to open education and open licensing. New Zealand served as a model for other countries to follow with its integrated initiatives led by both government and academic institutions to promote open education. This type of cooperation is required for OERs to be adopted systematically (Glennie et al., 2012). These initiatives were ways in which organizations in the New Zealand national ecozone favorably influenced the OERu's organizational ecosystem. One initiative was the development of Creative Commons Aotearoa New Zealand (CCANZ), which was later redeveloped into Tohatoha Aotearoa Commons (Tohatoha, n.d.). Developed in 2006, it was unique in that it caused several government departments to collaborate in obtaining funding for this initiative (Mackintosh, 2012). The year 2010 saw the launch of the NZGOAL initiative (which excluded tertiary education (Mackintosh, 2012)) to openly license materials produced by New

Zealand State Services and to provide guidance on how to use CC licenses (New_Zealand_Government, 2014). This initiative, the first of its kind in the world, encouraged use of the most open licenses: Attribution (or CC BY). In addition, New Zealand's Cabinet approved the Declaration on Open and Transparent Government in 2011, according to which unclassified and non-personal data was to be released publicly. This action contributed to a culture of openness. Initiatives such as these paved the way for further development and improvements of open initiatives (Mackintosh, 2012).

Initiatives for open education in New Zealand included the adoption of open source software in tertiary education via the Open Source Virtual Learning Environment project (Wyles, 2006). As a result of this project, the Moodle open source code was improved and made available to tertiary institutions; 77% of them used Moodle by 2012 (Mackintosh, 2012). Another New Zealand initiative was for Otago Polytechnic (OP) in Dunedin to become the "first tertiary institution in the world to adopt a Creative Commons Attribution intellectual property policy" (Mackintosh, 2017, p. 104). Because of this policy, the OERF's headquarters were established at OP (OER_Foundation, 2015). OP brought to the OERF its New Zealand culture which was formed by the Māori and Pākehā (descendants of European settlers). However, there were not habitually references to Māori culture or language in OERu courses, though they were common in NZ courses and public events.

The OERF was a charitable organization offering support internationally for promoting open education, in part by co-ordinating the OERu (Mackintosh, 2012). The OERu was established by the OERF with the aim of offering accredited courses to students not enrolled in tertiary institutions (Ministry of Education, 2014). In addition, students enrolled in Partner Institutions of the OERu were eligible for accredited courses. The aim was to increase access to accredited education for students worldwide (Mackintosh, 2012). While Otago Polytechnic provided the OERu with a location to operate out of, UNESCO provided it with funds to operate (OERu, n. d.-f). UNESCO, as a sponsor of

the OERu, and through the UNESCO chair of the OERu director and one of the OERF board members, was in the political sector. The involvement of UNESCO added prestige and credibility to this New Zealand-based initiative.

In 2019, the Centre for Open Education Practice (COEP) was founded to promote OER and OEP engagement in tertiary education in New Zealand (COEP, 2019). This organization worked with partners across New Zealand and with some international partners. The COEP, along with the OERu and the OERF, were all led by Dr. Mackintosh (COEP, 2019). We now turn to the chapter on methodology where I will lay out the details of my research on open education practices in tertiary education.

3.7. Conclusion

This chapter provided an overview of my methodology for conducting a literature review and the literature that I consulted, which was organised in sections with a scope that went from broadest to narrowest. The literature review began with an examination of publications that provided a broad view of publications on distance education over several years. This section provided a context to indicate how literature on OER and OEP fit in the broader topic. The chapter continued with an examination of literature reviews on open education, OER, and OEP. This section highlighted gaps in the research and indicated how my research aimed to fill some of them. The review of empirical studies was sub-divided into narrow topics related to OER and OEP. This section further refined the research gaps identified earlier. The chapter continued with an explanation of how the literature review informed my research design. An additional section examined the literature regarding open education initiatives in New Zealand. This section provided context for my research, since the focus was on the OERu, which was based in New Zealand and whose work was built on and largely supported by this country's initiatives and institutions.

Chapter 4. Methodology

This chapter presents my research plan. The research paradigm is presented to contextualize the choices of research methods (section 4.1) and is followed by an overview of the research plan (section 4.2). I then explore the literature to compare my plan to similar methods that others have used (section 4.3). This is followed by a description of the research methods and how they align with the recommendations from the literature (section 4.4). I describe strategies for validating the findings (section 4.5), and ethical issues and my responsibilities in addressing them (section 4.6). The final section (4.7) describes the different roles I adopted in the research.

4.1. Paradigm, ontology, epistemology, methodology

A research paradigm, or philosophical worldview, carries with it assumptions, beliefs, and practices that guide the methodology (Boeije, 2010; Creswell, 2014). I chose to conduct a qualitative study, and the paradigm most suitable for this study is Interpretivism - also called social constructivism (Creswell, 2007) - because it involves seeking understanding or making meaning of a social action by examining how the participants in a social world perceive it (Blaikie & Priest, 2017; Kivunja & Kuyini, 2017) or how they perceive a phenomenon (Brundrett & Rhodes, 2013). Participants' actions are informed by the meaning that they associate with their own and other's behaviors (Bryman & Bell, 2016). From their various perspectives, the participants construct meaning socially. Thus, to learn about their world, the researcher seeks information from them (Creswell, 2007) to empathize with them (Bryman & Bell, 2016) and to account for the context or frame of reference (Brundrett & Rhodes, 2013). To embrace the various viewpoints is to more reliably reflect the complexity of the participants' social reality (Creswell, 2007). Data can be gathered through observation of the participants in their natural setting where they interact, and through interviews using open-ended questions (Creswell, 2007). An advantage of open-ended questions is that they allow for the possibility of discovering important topics that the researcher may not have thought of; the flexibility allows the researcher to shift the direction of the research as necessary (Bryman & Bell, 2016). The researcher can collect artefacts and documents to piece together the historical and

cultural context. Indeed, the researcher must describe the context of the world under examination (Kivunja & Kuyini, 2017). The aim is to gain an understanding of how a world functions and the resulting effects (Bryman & Bell, 2016).

This paradigm requires that the researcher interpret meaning from data, personal biases, beliefs, values, experiences, and ways of thinking (Creswell, 2007; Kivunja & Kuyini, 2017). For this reason, it is crucial for researchers to identify their beliefs and biases on the topic at hand (Brundrett & Rhodes, 2013). The subjective quality of the data in the Interpretivist paradigm is seen as both a strength and a weakness (Blaikie & Priest, 2017), and there is a risk of the researcher leaning too far towards or away from the participants' views (Blaikie & Priest, 2017). There is also the risk of not acknowledging or understanding the influence of social structures on the meanings developed from the research (Blaikie & Priest, 2017).

In the interpretivist paradigm, meaning is developed iteratively through cycles of research steps (Blaikie & Priest, 2017; Brundrett & Rhodes, 2013). It involves examining the literature, observation of participants, and open-ended questioning. This data collection is followed by more specific questioning of participants, analyzing the data into increasingly abstract interpretations, developing theory, and having the work checked by the participants (Blaikie & Priest, 2017). The interpretations initially expand and increase in richness until data saturation is achieved. After this point, the data is condensed (Blaikie & Priest, 2017). The information gathered from research under the Interpretivist paradigm paves the way to developing theory (Kivunja & Kuyini, 2017) as the conceptual framework develops in an inductive process (Brundrett & Rhodes, 2013).

Qualitative research and an Interpretivist paradigm were selected for this study because it involves examining a phenomenon through an inductive research protocol that leads to descriptive and complex findings and themes (Bryman & Bell, 2016; Creswell, 2014). In Interpretivist studies, the

researcher collects data from multiple sources and from multiple participants who may have different perspectives and who were situated in natural settings, i.e., their workplace. In my research, the phenomenon consisted of Open Educational Practices (OEPs), and I examined an overall case of how the OERu implemented OEPs. Within that case were findings about the implementation of OEPs by individuals and teams at several institutions; they implemented OEPs within the context of their partnership with the OERu. The findings included perspectives from Rory McGreal, an anecdote of a single course developer named Wanda, my participant-observation of LiDA103, and vignettes about course developers and administrators at IIIU and EEEU. These participants had different types of experience and different levels of knowledge related to OER and OEP. My research aimed to examine these experiences and the complex understanding that they formed about the OERu and its Partner Institutions' engagement with OEP. The findings included data collected from online documents, discussion forums, and video recordings of meetings. These data sources added richness and nuance to the interpretation of the finding. As a qualitative study advances, the researcher's understanding and interpretation of the participants, findings, context, phenomenon, and case evolve and deepen (Bryman & Bell, 2016; Creswell, 2014, Gay et al., 2009). With this evolution come new questions, resulting in an iterative process of questioning and data collection and analysis (Creswell, 2014). This was the case in my research: my understanding and interpretation of my findings expanded and took different directions with each new interview and with the examination of documents and recordings. My understanding of the findings evolved with repeated examination of the data.

A paradigm is aligned with an ontology and an epistemology. An ontology is based on assumptions and defines social reality or shapes how reality is perceived within a paradigm and what is considered to be real (Boeije, 2010; Kivunja & Kuyini, 2017). How reality is perceived influences how the researcher makes meanings out of a research problem, findings, and in turn, conclusions and recommendations (Kivunja & Kuyini, 2017). According to the ontology of Interpretivism, meaning is

socially constructed, and there can be several realities (Creswell, 2007; Kivunja & Kuyini, 2017) which are not generalizable and are shaped by context and the individuals within it (Bundrett & Rhodes, 2013; Chilisa & Kawulich, 2012). In my research, there were several perspectives about the experience of engaging with OEP. For example, a person's experience can depend on the level of knowledge they possess of OER and OEP engagement and of the concepts of OER and OEP. Additionally, a person's role influences their experience of OEP engagement. Therefore, there are multiple realities to contend with; the meaning of OEP engagement is negotiable. The epistemology is the form of what we know or what is real and how to represent what is known (Boeije, 2010; Kivunja & Kuyini, 2017). In line with the epistemology of Interpretivism, meaning is subjective and socially constructed by the researcher and participants (Brundrett & Rhodes, 2013; Creswell, 2007). It is influenced by each person's perspective and experience (Creswell, 2007), shaped by culture and context (Chilisa & Kawulich, 2012), and language (Blaikie & Priest, 2017). My research aligns with the Interpretivist epistemology in that my findings are based on my participants' perceptions about OEP engagement, as those perceptions relate to the participants' contexts. The data I collected from documents and video recordings were also the result of different people's perspectives. The examination of the findings was influenced by my perception of participants and data and by my interactions with the participants. The examination was also influenced by my understanding of the conceptual framework, including my understanding of OER and OEP.

I conducted an ethnographic case study. I will break down this term into its components of "case study" and "ethnographic research" before reassembling the definitions into "ethnographic case study" again. A case study is the detailed examination of a contemporary process, an event, a community, an organization (i.e., a contemporary case). It occurs in a natural setting in a social context or system bounded in time and space (Gay et al., 2009; Gobo, 2008; Yin, 2014). In addition, the phenomenon must be clearly distinguished from its context (Yin, 2014). Thus, case study design involves making choices about what to study in what context (Gay et al., 2009). To conduct a case

study requires selecting among possible data points, involves a variety of data collection methods, and is enriched by a theoretical framework that informs the methodology (Gobo, 2008; Yin, 2014). Case studies are suitable for describing how or why a complex social phenomenon, event, or process occurred as well as its implementation and how successful it was (Gay et al; Yin, 2014). A good case study has these characteristics: it is significant (unusual, has a broad reach – national or international), and it is complete (boundaries are clearly defined, data collection is exhaustive following a full and critical analysis of the evidence, and the study ended based on the research design and not external causes). A good case study considers alternative perspective (e.g., rival perspectives or perspectives from people at different levels of a hierarchy), it displays sufficient evidence (excludes irrelevant data, presents data neutrally, maintains a chain of evidence), and it is written engagingly (uses clear and engaging prose) (Yin, 2014).

Ethnographic research primarily involves observation (Gobo, 2008) of participants in their natural setting and to examine their culture and describe it in rich detail (Gay et al., 2009). Culture includes "attitudes, values, concepts, beliefs and practices shared by members of a group" (Gay et al., 2009, p. 404) as well as vocabulary and various perspectives (Johnson & Christensen, 2008). Culture can be broken down into location of the participants, how members of a group behave, and why they behave that way (Gay et al., 2009). The participants are observed for extended periods with the researcher immersed in the field as an observer or participant-observer (Gay et al. 2009; Gobo, 2008) to make sense of behavioral patterns within a meaningful context. A researcher attempts to describe the participants and their interactions holistically (Johnson & Christensen, 2008). Ethnographic research can include an examination of things produced by the participants (Johnson & Christensen, 2008).

In my research, the natural setting for the OERu and for the participants from IIIU was online; their interactions occurred in online platforms and through online communication methods. The natural

setting of the participant from EEEU was his shared workspace with his colleagues as this institution. Hine (2017) acknowledged that it can be challenging to observe interactions when people are not in the same physical space. However, she considers that online interactions can be observed in ethnographic studies as part of valid and credible research. She states: “If people do it, that is enough to make it a legitimate focus for ethnography. The task, as I understand it, is to explore the way that life is lived and relationships enacted, through whatever medium is used by the people concerned” (Hine, 2017, p. 22). O’Reilly (2012) agrees, indicating that the researcher should engage in ways similar to the participants: write a post on a micro-blog, exit the field site temporarily, and re-enter the site later to see if there are responses. My methodology aligns with O’Reilly’s recommendation: I used online tools and platforms to communicate with my participants. I used these communication methods to learn about my participants’ culture as Open Education Practitioners. Their culture included the value of sharing educational resources; knowledge about OER, open education, Creative Commons licenses, and educational technology; and Open Educational Practices such as training educators about OER, design and development of OER, and delivery of open courses.

Putting these definitions of case study and ethnographic research together to form a definition of ethnographic case study in the context of my research gives the following result. It was the examination of processes in natural settings bounded in time and space. The research was informed by a theoretical framework and took into account the cultural context, language, and materials produced by the participants using a holistic approach. I examined the process (the case) of the implementation of open educational practices by tertiary education institutions (OERu, IIIU, EEEU). I understood much of the language of open education when I began this research and expanded my understanding of it as my research progressed. I examined OER as courses that were designed, developed, and delivered by the participants. My research was shaped by Davis' (2018) Arena and Cox and Trotter's (2017b) Pyramid frameworks. The Arena took a holistic view of the educational

systems in my research by considering roles and matter at several ecosystem layers and five sectors. Both frameworks considered culture in different, but compatible ways. I examined the organizational culture at the second of Schein and Schein's (2016) three levels while using Cameron and Quinn's (2011) CVF for coding my findings.

4.2. Overview of the research plan

This research included a pilot and a main study representing different phases of a single case study. It was an embedded single-case design (Yin, 2014), and the units of analysis are presented in Table 4.1. This is a case of OEP implemented by the OERu and two of its Partner Institutions. The OERu is examined as a case study, which includes perspectives from the OERu CEO and Rory McGreal, who shared his experience with open education at his institution. The OERu case study also includes an anecdote shared by a participant named Wanda, and my participant-observation of LiDA103. The two Partner Institutions are examined as vignettes embedded in the larger OERu case study. In the pilot, this was partly an exploratory and partly a descriptive case study, and in the main study, it was fully a descriptive study (Yin, 2014). An exploratory case study is one used in designing a research project as it aims to develop research questions and methods for further research (Yin, 2014). Descriptive case studies aim to describe a case (event, phenomenon, etc.) within a given context in a natural setting (Yin, 2014). The pilot was exploratory to the extent that it was used to refine the research design and to choose OERu institutional partners to examine. The descriptive portion of the case study refers to my examination of the OERu and my analysis of its OEPs of open communication and open philanthropy (Chapter 5). This examination is not to be considered an in-depth analysis, but rather a context description which was required since the OERu The rationale for this case study relates to the unusual character of the OERu and how it conducted its work with radical openness and attempted to influence its PIs to adopt open educational practices .The descriptive case study continues in Chapter 6 with the examination of the OERu's OEPs of course design, development and delivery of an innovative course called Learning in a Digital Age which occurred in 2017-2018. The descriptive case study also includes an examination of OEPs by two PIs where they separately

designed and developed OER for the OERu as pilot projects. They are examined as vignettes in Chapter 7.

As summarized in Table 4.1, the organizations and their processes were examined using Davis' (2018) Arena of change with digital technologies in education. In implementing their OEPs and particularly those of design, development, and delivery of OER as a course, they encountered enablers and inhibitors. In this research, these terms are both referred to as stressors; they can have a positive and negative influence on OER engagement. Stressors can also stimulate the species to change their behavior regarding education and technology and thus cause an ecosystem to evolve. For this reason, stressors have an important role in this research. The stressors were analyzed using Davis' (2018) Arena as extended by Cox and Trotter's (2017b) Pyramid of OER adoption. Indicators of organizational cultures at the "espoused values" level were codified using the typology of Cameron and Quinn's (2011) Competing Values Framework.

The research, as broken down by its stages and cases are the following:

Pilot and Main Study

1. I examined the OEPs implemented by the OERu. This work consisted of an ethnographic case study and included an anecdote about collaboration to develop an OER and participant-observation of LiDA103.

Main Study

2. I examined the OEPs implemented by the Intelligently Intellectual Instructional University (IIIU), which is a PI of the OERu. I conducted an ethnographic case study in the form of a vignette.
3. I examined the OEPs implemented by the Excellent and Effective Educational University (EEEU) I conducted an ethnographic case study in the form of a vignette.

The next section explores how this plan translated to the actions I took to conduct research and begins with an exploration of the role of the theoretical framework.

Table 4.1. Units of analysis of the ethnographic case study, plus corresponding data collection methods

Unit of analysis	Guiding sub-question	Topics examined	Data collection methods
OERu	How are tertiary education institutions implementing OEPs, particularly for instructional design, development, and delivery of OER as courses?	General processes of course design, development, and delivery Processes of professional development for learning how to use the OERu processes and platforms	Interviews Document analysis Observation of meetings
	What are the stressors involved in OER engagement and OEP implementation?	Stressors to OER engagement, OEP implementation, and involvement in OERu activities	
	What are the organizational cultures at the second level (espoused values) at the institutions involved in this research?	OERu's organizational structure and ideology Open educational practices of open communication and open philanthropy	
Anecdote about collaboration to develop OER	How are tertiary education institutions implementing OEPs, particularly for instructional design, development, and delivery of OER as courses?	Design, development, and delivery of an openly licensed course (delivered in 2013)	Interview Document analysis of the course site
LiDA103	How are tertiary education institutions implementing OEPs, particularly for instructional design, development, and delivery of OER as courses?	Design, development, and delivery of an openly licensed course (delivered in 2018)	Interviews Document analysis of the course planning and development pages and published pages Participant observation/volunteer facilitation of LiDA103
IIIU	How are tertiary education institutions implementing OEPs, particularly for instructional design, development, and delivery of OER as courses?	Design and development of an openly licensed course for the OERu using the OERu's platform as a pilot project OEPs as services for students (accreditation for prior learning, open admission, etc.)	Interviews Document analysis of the university's web site and of IIIU's course planning and development pages
	What are the stressors involved in OER engagement and OEP implementation?	Stressors to OER engagement and OEP implementation	
	What are the organizational cultures at the second level (espoused values)	Institutional processes	

	at the institutions involved in this research?		
EEEU	How are tertiary education institutions implementing OEPs, particularly for instructional design, development, and delivery of OER as courses?	Design and development of an openly licensed course for the OERu using the OERu's platform as a pilot project OEPs as services for students (accreditation for prior learning, open admission, etc.	Interviews Document analysis of the university's web site and of EEEU's course planning and development pages
	What are the stressors involved in OER engagement and OEP implementation?	Stressors to OER engagement and OEP implementation	
	What are the organizational cultures at the second level (espoused values) at the institutions involved in this research?	Institutional processes	

4.3. Comparison of my research with examples from the literature

I examined the literature to find ethnographic case studies involving combinations of OER, tertiary education, and online learning and selected three studies. The purpose was to examine methodologies to roughly compare them with mine to determine whether my research plan was suitable for answering my research questions. Subsequently, I describe how I validated my methodology.

In the first study, Hunt and Oyarzun (2019) conducted a qualitative ethnographic case study research involving two Native American female university students who attended the same institution. Each one was interviewed and wrote three journal entries in addition to providing demographic data. The journal entries were made using an electronic survey about online coursework related to their Native American identity every four to five weeks. The data was coded using a framework based on respect, responsibility, reciprocity, and relevance (Kirkness & Barnhardt, 2016), and NVivo software supported analysis. The limitations listed by the authors were the low number of participants and a lack of literature on the topic. There were no observations conducted in this research, and given the topic, this choice seemed suitable. This work was similar to mine in involving tertiary education and interviews with coding and the use of NVivo. However, this study was on a smaller scale and focused

on the learners' perspective, while mine focused on that of course developers and administrators. Our theoretical frameworks also differed.

In the second study, Vázquez-Cano, Martín-Monje, and Castrillo de Larreta-Azelain (2016) conducted action research within a virtual ethnographic methodology. They observed tertiary education students develop OER within a personal learning environment (PLE). There were 68 participants from the same institution, 37 of whom were female and 31 were male. The participants were observed in a virtual learning environment in a Master's level course entitled "Creation and edition of printed and audiovisual materials". The authors used this hypothesis: "The PLEs' implementation under OER design is a productive teaching-learning strategy in Tertiary education", and they assessed PLEs for use in tertiary education and analyzed how well participants developed skills such as digital skills and content creation when creating OER. The participants developed several OERs for foreign language learning as an assignment in this course and used the following collaborative software: Lino (for sharing content mostly on digital sticky notes), Prezi (for zoomable and rotatable presentations), Mindomo (for creating mind maps), Aurasma, (an augmented reality application), and video creation tools. The students used the free tool called Symbaloo to organize their PLEs and the OERs they had created. The students used discussion forums and filled a questionnaire about their perceptions of the course and their tasks. Vázquez-Cano et al. (2016) used discourse analysis, content analysis, participant observation, and network analysis. This work was similar to mine in that I observed learners in a tertiary education online course, and learners used discussion forums. Also, a PLE is similar to the NGDLE in my research in that they support student-student interaction, and the learners were in a course for developing digital skills. Differences between the two studies include Vázquez-Cano et al.'s use of action research while mine consisted of case studies. Vázquez-Cano et al. knew the number of students along with some demographic information. In contrast, I only knew the identities of my interviewees and not that of the learners in the course I observed. Additionally, many platforms for social and learning interaction were different in the two studies.

My study had no questionnaire, and the learners in my study were distributed globally, were not enrolled in a program, and were not taking a course for credit. An additional contrast was in analytical methods. Vázquez-Cano et al. (2016) used techniques that I did not: network analysis to examine student interaction and text analysis to determine the frequency of text in the questionnaire. There were no limitations presented in this article. In this study, the methodology lacked clarity. For example, it was not clear how many researchers observed the work, how many online pages were observed, or how many hours were spent in the field. It was not clear how discourse analysis or participant observation were performed or what kind of information was collected. It was not clear how the authors played the role of participant-observer (to what extent the researchers participated or observed). The findings focused on questionnaire responses and were not significantly enriched with descriptive data based on participant observation or content analysis. Consequently, it was difficult to make sense of the data, to follow the authors' logic, and to make sense of their conclusions. In contrast, I attempted to make my research clear and coherent.

In the third study, Carfagna (2018) conducted an ethnographic case study as part of a larger project. The author conducted 51 interviews with 34 American participants (open learners) ranging from 18 to 34 years old. That age group was selected as the author determined that it was the one most strongly affected by the 2008 financial crisis while also likely being among early adopters of technology for sharing. Carfagna conducted 300 hours of participant observation of interactions in online learning sites both online and offline. The author used Bernstein's theory of pedagogic discourse as a lens to examine the findings. Interviewees were selected based on the participant observation and recommendations from other interviewees and from employees involved in supporting the open platform. The interviews lasted 45 to 90 minutes and were conducted in person or on video chat; only two were conducted over the phone. The interviews were transcribed. They and the field notes were coded using Dedoose, and the codes were chosen based on the larger project. In the analysis, the author used inductive and deductive processes. During the inductive

coding process, the researchers read transcripts out loud, and research assistants used open coding. There were no limitations outlined in this article. This research is similar to mine in that it involved interviews of a similar length. It also involved participant observation of learners in a virtual and open community. However, Carfagna's participants were selected from one region and age range and mine were not, except for John, who had interacted with his colleagues in the same location. The participants in my study who provided data about the OERu and IIIU interacted online, and they were of interest to me because they were the interactions that occurred while implementing OEPs. Carfagna's interviews and observations were with students, whereas mine were with course developers and administrators. Additionally, only a short portion of my work involved participant observation of students. My work involved a different theoretical framework and a different tool for analyzing coded data. Carfagna and I both used a combination of inductive and deductive analytical approaches, but it is not fully clear how Carfagna used those approaches.

4.4. Research methods

The pilot in this research initiated the ethnographic case study of OEP implementation by the OERu which developed in the main study. I used purposive sampling of "maximum variation" to select sites, participants, and other sources of information which varied greatly from each other in order to construct rich, specific stories about a few cases as per Creswell (2007, p. 129). I chose two Partner Institutions (PIs) located outside of New Zealand that had developed at least one course for the OERu. At each institution, I aimed to interview people in two positions: course developer and administrator or executive. IIIU had a department dedicated to open education, while EEEU had people working on aspects of open education diffused throughout the institution. Thus, it was expected that there would be interesting comparisons and contrasts to make among the universities and OERu.

Site visits were not practical; the OERu existed online for all but three days of the year, when some of its members attended annual OERu meetings. There were rare additional face-to-face meetings.

The OERu community consisted of people working separately at a computer or device at their home, office, or other location. I mostly examined OERu sites that were no longer active (thus, I did not observe human interactions in real time). I visited planning pages about meetings occurring during my research period along with currently used discussion boards, and I observed an OERu micro-course as it was delivered. For IIIU, the OEP of course development work examined in this research occurred online several years after course development had finished. The course developers worked at a distance from each other in their free time, though they were colleagues at IIIU. At EEEU, the work occurred in a face-to-face manner with the course developers occasionally interacting with OERu staff online. Thus, with the OERu and IIIU, the participants had formed virtual communities in that the internet was the participants' context where communication was mediated through social media, discussion forums, collaborative pages, etc. (van den Hoonaard, 2012).

Participants

For the pilot study, I interviewed Wayne Mackintosh, Rory McGreal, Stephen, and Wanda as part of the OERu case study. They were selected because that had all participated in the foundation of the OERu and had all been involved in development of OER. Their biographies are provided in Table 4.2. In the main study, I conducted an additional interview with Stephen, Samantha, Trevor from IIIU and John from EEEU. I tried to recruit more people from EEEU but other obligations prevented them from participating. I contacted these people via email to formally invite them to be a part of my study. The professional identities of the interviewees, their names or pseudonyms, and coded names are as follows.

Table 4.2. Descriptions of research participants

Wayne Mackintosh (real name)	Director of the OERu and has worked in open education for a large part of his career as an academic. He is a UNESCO and ICDE chair of OER. He is strongly inspired by the open source community and different ways of coding. He was interviewed twice: in the role of administrator of OERu and in the role of course developer for the OERu. In the findings, he is referred to as Wayne_AD and Wayne_CD to indicate the respective roles he was in at the time.
Rory McGreal (real name)	Professor at Athabasca University and was a UNESCO/ICDE chair of OER. He has led several international initiatives for the promotion of OER (AU, n. d.). He is a

	member of the Board of Directors of the OERu (OERu, 2016a).
Stephen (pseudonym)	Director of an instructional design team at IIIU. He is a founding member of the OERu and has a great amount of experience in instructional design. He also has long experience with open education in different forms, including OER, distance education, and recognition of experience for credit. He has conducted research on open education and presented at conferences on the topic of open education. Stephen was interviewed twice: as an administrator and as a course developer. Thus, the respective codes for referring to him are Stephen_AD and Stephen_CD.
Wanda (pseudonym)	Professor who studies elearning among other topics. She works at pedagOgically infOrmational knOwledge University (OOOU), a founding member of the OERu. She worked on a project with the OERu CEO who was hired as an adjunct professor at her institution work with her. The project involved taking a two-week portion of one of Wanda's formally credited courses that was in a closed LMS and redeveloping it as a Free Cultural Work. Wanda taught the majority of the course to students registered at OOOU ("closed" students), and opened up the two-week portion so that students not registered at OOOU ("open" students) could participate, albeit without credit in this open boundary course.
Samantha (pseudonym)	Senior instructional designer at IIIU who developed online undergrad and graduate courses in a variety of modalities. She has led training workshops on course and program development, cultural inclusion, and equity, among other topics. She has been an advocate for OER, for students, and for instructional designers and faculty.
Trevor (pseudonym)	Director at IIIU. He has taught and worked in various learning technology roles at universities for approximately twenty years. He has been at IIIU for seven years and has supervised the learning technology team, including online course and media production. He works with faculty on implementing learning technology into their courses he also has a wide range of administrative roles such as management and committees. He has had fellowships with various institutions, including some that focus on open education.
John (pseudonym)	Manager of open educational practices at EEEU. Through this role, he supports teaching and learning in open environments and in using OER. He is working to make open educational practices a part of mainstream practices at his institution. He was part of a team that developed an OERU course.

Data Collection

My data collection methods included techniques suited for ethnographic case studies consisting of techniques described by Creswell (2007): interviews, observations, and analysis of documents and digital materials. Although the primary source of data was the interviews, it was important to begin by analyzing the OERu's open documents to learn about its operations before obtaining more

detailed information in the interviews. The pilot aimed to uncover open educational practices as part of general practice and as course design and development at the OERu. I tracked and organized the data collection process using a detailed electronic filing system and multiple backups.

Interviews

The purpose of interviewing is to explore the meanings that people ascribe to actions and events in their cultural worlds. Answers are expressed in their language. The purpose is also to generate participants' descriptions of key aspects related to their cultural world – space, time, events, people, activities, and objects (Spradley, 1979). In semi-structured interviews, the interest lies in the interviewee's perspective, and seeing what he or she believes is important (Bryman, 2016). An implication is that points that the interviewees believe not to be important or relevant will not be shared, or that the researcher may misinterpret the importance of what was or was not said. Questions should not be so specific that they reflect the researcher's preconceptions or close off possible topics that the interviewee would have otherwise discussed. The interview may go in unexpected directions, based on what the interviewee has to share; major unexpected issues may arise. More importantly, the researcher intends to obtain rich answers (Bryman, 2016). A skillful interviewer understands the interview topic, can steer the conversation to attain research objectives, and can clarify points where the interviewee appears to have been self-contradicting. An effective interviewer is also ethically sensitive; the interviewer will inform the interviewee about the interview topic and purpose and about considerations taken for protecting confidentiality (Bryman, 2016). An interviewer can ask different types of questions: follow-up questions to obtain explanations, specifying questions to obtain details, and probing questions to obtain elaboration (Kvale, 1996).

When asking a probing question to clarify an answer that the interviewee has already provided, Roulston (2010) suggests reciting the interviewee's words rather than a summary or paraphrasing. Roulston also suggests using non-verbal interjections ("uh", "oh!") or gestures or facial expressions

(head nod, or inquisitive expression), to probe. For example, “When I asked you about ___, you responded ‘___’. Please tell me more”. By using the interviewee’s words, the interviewer avoids contaminating the idea by introducing terms or expressions the interviewee would not normally use (Roulston, 2010). Such approaches are helpful since interviews have inherent shortcomings (Gobo, 2008). For example, interviewees asked to describe their actions or habits may present information that does not reflect how they actually act. Other shortcomings are divergent understandings of a topic by the interviewee and interviewer, poor recall of events, and a misunderstanding of the purpose of the interview or meaning of the question (Gobo, 2008).

Putting this guidance to practice, I took the following approach in my interviews. Each of my interviews began with a brief amount of informal discussion so that the interviewee and I could learn about each other and our professional backgrounds. I explained my research purpose and my reasons for inviting the interviewee to be a part of my research, I asked about concerns about confidentiality, and then I informed the interviewee when I was about to begin the recording. At my desk, I had two laptops opened: one for conducting an interview over Zoom (with Audacity to record the sound) or Adobe Connect for capturing video and sound, and the other to display the questions and take notes. The question lists are in appendices 3, 4, and 5. In these lists, the first question in each point of the numbered list was the main question. The remaining questions were more specific or came from a slightly different angle and were to be used if I felt that I needed a more developed answer. I also used prompts such as “Tell me more” or “You mentioned ‘…’. Can you describe it in greater detail?” I developed the questions based on my research question and also on questions I found in studies in my literature review that seemed to have led to rich and relevant answers.

During the pilot, I carried out semi-structured individual interviews with participants based on their roles at the OERu – either course developers or executives (see the lists of prepared questions for administrators and course developers in Appendices 3 and 4, respectively). An example of one

person who had two roles was Wayne. I interviewed him in two separate interviews of 60 minutes, the first focusing on his role as an executive of the OERu, how OEPs were implemented at the OERu, how the OERu assisted Partner Institutions in implementing OEPs, and the OERu's organizational cultures. Questions pertaining to organizational cultures were those about a culture of sharing and about management approaches to support OER engagement in Appendices 3 and 4, plus the questions in Appendix 5. I posed the same questions to Rory. The second interview with Wayne was about his role as a course designer and instructor. Among other things, I asked about the tools and design approaches he used for building courses, and how he worked with course development teams. I used the same questions for Stephen and Wanda's interviews. At the end of the interviews, I asked the participants to name literature sources and other people who might be able to tell me more about the OERu's administrative or course design processes. In the vignettes, I used both sets of questions mentioned above. The questions for administrators were used with Stephen, Trevor, and John, while the questions for course developers were posed to Samantha and John. All interviewees had experience with the OERu. Those from IIIU and EEEU were thus able to share information about their institution as well as the OERu. After I interviewed these participants, I sent follow-up questions to some of them to clarify or elaborate on gaps or points of confusion that I discovered during my data analysis. The interviewees are identified in Table 4.3. according to their role in each interview and the institutions described in their interviews.

Table 4.3. Participants' roles in interviews and the institutions they described

Institution(s)	Role of Course Developer	Role of Administrator
OERu	Wayne_CD	Wayne_AD
OERu		Rory
OERu	Wanda	
OERu + IIIU	Stephen_CD	Stephen_AD
IIIU	Samantha	
IIIU		Trevor

OERu + EEEU	John_CD	John_AD

The interviews were audio recorded using Audacity except for that of Rory. I made a video recording of our interview on Adobe Connect and placed the recording on YouTube with a CC-BY license at Rory's request. Following each interview, I transcribed the recording verbatim using OTranscribe (OTranscribe.com). I played the clips in short sections and rewound them as necessary as I typed. I replayed the recording in longer sections to make sure I did not miss details. I used quotation marks when an interviewee quoted someone else, and I used dashes to indicate self-interruptions. I did not transcribe interjections (e.g., "oh", "uh") or take note of pauses, vocal emphasis, emotional expressions, or physical sounds like sighs or throat clearing or background noises. Since I did not see the interviewees' faces except in Rory's interview, I could not observe facial expressions or body language. I was interested in the interviewees' ideas and sought to rigorously type their words. This approach is in accordance with the position that transcription is not simply a mechanical process of transforming aural content to text (Gibson & Brown, 2009). Rather, it is influenced by the transcriber's analytical decisions about the type of content to represent in text form and the approach for representing it in a new form. In my case, the choice was to accurately write the interviewees' words and strip away anything that was not expressed verbally. It follows that I did not analyze any emotional expression of any form of content in this research. An advantage I had during the transcription was that the interviewees all resided in developed countries and spoke English fluently, so I had a basis for common understanding with them.

Several sources of error could have affected my transcription. I may have misrepresented the intended messages of my participants' due to their accents (Altheide et al., 2003). In cases where it was possible that the interviewee meant something other than what was said, I made comments to that effect in NVivo after I had copied the transcripts there, and I followed up with the interviewees over email. There were some words that I initially transcribed incorrectly. I corrected those errors

when I discovered them, which was sometimes well into the analysis phase. However, the analysis was not affected. Sometimes, I had to replay portions of a recording repeatedly to make sense of it, since the interviewees' accents made some words difficult to understand. As necessary, I clarified the meanings of specific words or phrases with the interviewees. I also sent them the transcripts for member checking. With Samantha, the interview was not properly recorded because I used earphones, which blocked the sound from being captured by the computer's microphone. When I discovered this problem, I immediately wrote notes of as many answers as I could in the greatest detail possible and asked Samantha to fill in blanks as part of the member checking. Unfortunately, I had much less data from this interview than any other, so Samantha's responses did not feature as prominently in my research as they might have if I had been able to record all of her responses. An example of a transcribed portion of an interview with Rory is shown in Figure 4.1. His answers are marked with a time stamp, and my interjections are marked with the label "Question". I chose to present content from his interview since he had already asked for that content to be shown publicly in a YouTube recording. I could thus avoid exposing any other interviewees' answers and risk revealing their identity.

Question: What kind of resources or training do you think are required to facilitate the development of OERs by staff?

10:55 Instructional design, but you're not going to get most faculty to take any courses or do anything about it. At AU, we have IDs who work with faculty, and that's how we've been developing our courses. My view is that it would work the best, is if we have IDs working with faculty. That's one of the reasons I say we're in a good position at AU to do this. In other universities, they don't have this setup at all.

Question: When they develop courses, is it just with an ID, or is there a project management team?

11:58 There is an ID, a techie, and a subject-matter expert. Sometimes they alternate depending on their skill sets. Also, it goes through the copyright office and the copy writers. That's for the development of any course at AU. What we're doing now is supporting "deboning", and that means removing commercial content and we're seeing which commercial content we can replace with OER. So we'll take out a commercial chapter and put in an OER chapter. We're doing that in a more-or-less systematic way. Faculty, the subject-matter expert, has the last say in that.

Figure 4.1. Excerpt of a transcript from the interview with Rory McGreal.

Observation

Observation can take several forms on a continuum from, at one end, the detached complete observer to the observer-as-participant, to the participant-as-observer, to the other end, with the involved complete participant (Bryman & Bell, 2016). In the role of complete observer, the researcher does not interact with the participants. This position carries the risk of reducing the understanding to be made out of the observations. This is because the researcher is not directly involved with the participants and does not ask them questions (Bryman & Bell, 2016). In contrast, the complete participant takes on a covert role and participates fully with the participants (Bryman & Bell, 2016). The participant-observer operates in a similar fashion as the complete participant, but does so overtly. The observer-as-participant participates minimally; the research consists mostly of interviews and observation (Bryman & Bell, 2016). Participant-observation introduces bias and may require the researcher to withhold certain views or adopt others (Yin, 2014). The observed participants may be so numerous and active that it can be difficult for the participant-observer to take sufficient notes or ask enough questions to document or understand a particular set of interactions (Yin, 2014). In my research, most of my observations were conducted as a complete observer of video recordings of meetings. I shifted to the role of participant-as-observer when I co-facilitated LiDA103.

In the pilot study, I acted as a complete observer and observed four previously recorded OERu administrative meetings and one about course development for the OERu. They were available on YouTube. In the main study, I observed three additional previously recorded OERu administrative meetings. I documented ways in which the meetings were facilitated, and I documented ideas shared for the advancement of OEPs at the OERu and its Partner Institutions. Three of the meetings were held online and five, in person. I was not a participant in these meetings. I will address the disadvantage mentioned above, of not being able to gain deep understanding of an event as a complete observer. If my research had required it, I could have contacted the people in the videos or the OERu CEO for clarification. The videos of meetings required little additional explanation for

several reasons. They were accompanied by agendas and reports, many of the OERu meetings were conducted in similar ways, and there was little interaction among the participants. See Table 4.4. for a summary.

Table 4.4. Video recordings of OERu meetings that I observed after they occurred

Video title and URL	Description of video	Location and date of meeting
LiDA 16-06 Course team meeting [Video]. Retrieved from https://www.youtube.com/watch?v=OgzBMa3Fll8	Online meeting to discuss the LiDA course and its curriculum	Online 3 June 2016
OERu 2016-09 - Planning the agenda for the 2016 Partners meeting [Video]. Retrieved from https://www.youtube.com/watch?v=09Jy7YWfi1E	Online meeting to discuss the agenda of the 2016 International Partners meeting	Online 7 Sept 2016
OERu16-10 Improving operations [Video]. Retrieved from https://www.youtube.com/watch?v=oZF1af5Pg0w	Face-to-face session during the 2016 International Partners meeting	Inverness, Scotland 3 - 4 Oct 2016
OERu 16-10 - Critical friend review [Video]. Retrieved from https://www.youtube.com/watch?v=-h9P8seFop0	Face-to-face session during the 2016 International Partners meeting	Inverness, Scotland 3 - 4 Oct 2016
OERu 16-11 Oceania meeting agenda consultation (Part A). Retrieved from https://www.youtube.com/watch?v=3hVQioeRirQ& OERu 16-11 Oceania meeting agenda consultation (Part B). Retrieved from https://www.youtube.com/watch?v=g4eKPQMpumI&	Online meeting to plan the 2016 Oceania regional meeting. Recorded in two parts.	Online Approximately 14 Nov 2016
OERu 17-10 - Feedback Session 3 [Video]. Retrieved from https://www.youtube.com/watch?v=by1JwqVjDCk	Face-to-face session during the 2017 International Partners meeting	Toronto, Canada 12 & 13 Oct 2017
OERu 17-10 - Session 4 [Video]. Retrieved from https://www.youtube.com/watch?v=f8lhImM5jCQ	Face-to-face session during the 2017 International Partners meeting	Toronto, Canada 12 & 13 Oct 2017
OERu 18-11 Session 5 feedback [Video]. Retrieved from https://www.youtube.com/watch?v=bg41oMDnUlU	Face-to-face session during the 2018 International Partners meeting	Port Macquarie, Australia 7 & 8 Nov 2018

In the main study, I adopted the role of a volunteer co-facilitator of an open online course developed by the OERu called Learning in a Digital Age (LiDA) with the enthusiastic approval of the OERu CEO who facilitated the course. I collected data regarding course content, activities, discussions, and assessments. As a participant-observer, I also observed students' posts and interactions and removed identifying information about students when reporting findings. I conducted observations and data collection for approximately 10 hours over two weeks of the delivery of the micro-course LiDA103 *Open education, copyright and open licensing in a digital world* from May 8th to 22nd, 2018. To establish my presence as an overt observer, I wrote an introductory post to describe my roles in the course. I avoided flaunting my credentials to reduce the likelihood that my presence would be

perceived as a threat or a cause for embarrassment (Bogdan & Biklen, 2007). My role was as an outsider; I would have had the role of insider if I had been taking the course with the same status of learner as the people I observed. As an insider, I may have been better able to empathize with the learners, since my experience would have been similar to theirs (O'Reilly, 2009). However, I was already familiar with the course content. I did not encounter the challenge of being overwhelmed by the participants' activity. Low participation in discussion forums and other communication channels was low enough for me to observe and take notes comfortably.

It is possible that my presence as a researcher discouraged learners from posting through the course's communication channels since they may have feared that I would write about them in ways that they may not have agreed with or liked. The learners could have also feared that I would expose them in a way that would cause them harm (Taylor, Bogdan, & DeVault, 2016). These possible fears were a consequence of the power differential between the learners and me; I had control over how I would report about them. However, abuses of that power would have been limited by the OERu CEO as a course facilitator and by my supervisors, who read my reporting of the findings.

Participant observation is the most common form of observation used in qualitative research. Ideally, it involves spending time in a social setting observing the behaviors of participants forming a social group. The researcher observes actions, interactions, conversations (verbal and non-verbal communication) of the participants with each other and with herself or himself. The researcher aims to uncover the participants' culture by deriving meaning from the environment and observed behaviors (Bryman, 2016). A series of observations should help to find patterns of behavior. Jones and Somekh (2011) suggest interpreting the observed culture and drawing conclusions based on rich and detailed descriptions. Besides participants' behaviors, things that can be observed include the time and place (Bryman, 2016). In a face-to-face environment, a researcher relies on the five senses to make observations (Jones & Somekh, 2007).

Much of this knowledge about observations was difficult to apply in my observation of student interaction in LiDA103. This was because of the short amount of time I spent in the field, the limited amount of interaction, and the almost exclusive use of text for communication. In the OERu case study, there were limitations to my observation of recorded meetings. For example, in these recordings, I could only see what was captured by cameras and microphones set up by someone else, and only when they were on. The meetings were recorded using Zoom, where up to four participants or screens could be viewed in the right margin of the screen (see Fig. 1) if they had their cameras turned on. Otherwise, a blank screen or a static image was shown (see Fig. 4.3). I digitally masked participants' faces in this image using black markings. When face-to-face meetings were held, one problem was that the camera was in a fixed position to capture a large portion of the room, though without including everyone in the room. The camera was so far away from any given face that it was nearly impossible to tell who was speaking, let alone interpret facial expressions. An example of the result of this type of camera positioning is shown in Figure 4.2. in the right margin, third image from the top.

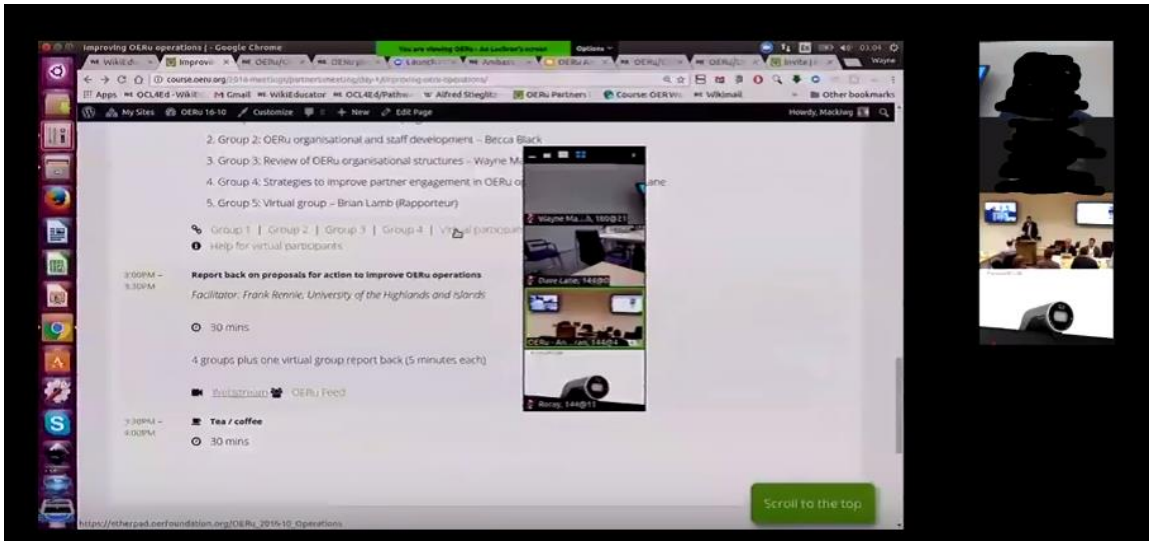

Figure 4.2. Image taken from a recording of a meeting Screen capture taken on August 14th, 2017.

One advantage of conducting online observations is that I had the opportunity to observe people from all over the world who participated in OERu meetings. I also had the freedom to replay the

recordings as many times as I needed to, play them at high speeds to quicken the analytical process, take time stamps and screen captures, and select any time stamp to start viewing. Consequently, I used multiple viewings to detect patterns, observe details, and take rich notes. These meetings did not have the same set of participants throughout except for the OERu CEO who attended them all. Thus, I could not establish patterns of behavior among individuals except him. Rather, I observed how OERu meetings were run, and how the meeting attendees participated as an ensemble of people. This form of open communication for planning open education is an OEP.

For a researcher entering the field, it is normal to feel anxious and vulnerable when first observing an environment since the researcher is developing data-collection skills and has no or little experience to refer to. Once the researcher has established rapport with members of the observed community, the feelings of incompetence, self-consciousness, and of being overwhelmed with information start to subside (Bogdan and Biklen, 2007; S. J. Taylor et al., 2016). The result is that both the researcher and the participants become accustomed to each other's presence, and eventually, participants may extend invitations to the researcher to attend social events. In the case of the YouTube videos, there was no anxiety, since I was not participating in the meetings, and I could not develop a relationship with the participants. In the case of the live course, there was a great deal of anxiety because anything I wrote was visible to anyone. Additionally, my posts would stay recorded online indefinitely. However, they were mostly only visible to people who knew of the course, and who entered into each section where there were posts. Given the low amount of student participation in the course, it was not possible to develop a relationship or rapport with anyone, let alone develop social relationships. In some cases of participant-observation, there is the risk of over-rapport which means that the observer can get too involved with the participants and take on their viewpoints. The implication is that the observer does not stay neutral and objective, but rather becomes biased and reports in favor of some or all participants (S. J. Taylor et al., 2016).

In my case, there was not enough interaction between the students and me for this risk to materialize.

Document analysis

Document analysis is a process of building meaning by analyzing documents, including archival documents, journals, maps, audiotapes, artefacts (Gay et al., 2009) videos (Gay, et al., 2009; Yin, 2012; 2016), social media (Yin, 2016), archived online interactions (Bryman, 2016) and the broader category of electronic records and sources found in newspapers and the mass media (Yin, 2012). In my research, I collected data from the websites of the OERu, IIIU, and EEEU. I also collected data from social media sites, where the OERu posted messages and news articles about its activities.

Data collected from documents is coded into data. From them, themes emerge and develop meaning based on the context of the study (Bryman, 2016). Documents created by an organization can reveal aspects of its culture and are "windows onto social and organizational realities" (Bryman, 2016, p. 560). Additional roles of documents include guidance and maintenance of practices and procedures which can inform how bureaucratic relations are manifested. They can promote or diminish various people, concerns, and events (van den Hooven, 2019). Documents from my research that revealed bureaucratic relations were the agendas and reports from the International Partners meetings which occurred annually near the end of the year. These documents revealed the nature of the OERu's bureaucratic relationship with its PIs, showing that their staff members were welcome to post and edit content. For this reason, they are often cited throughout Chapters 5 and 6. Further, at the end of Chapter 5, an analysis of documents related to a series of meetings spread over several months reveals a strong pattern of the OEP of public consultation by the OERu. Thus, the analysis of these key documents as indicators of how OEP were implemented by the OERu should increase the trustworthiness of my research.

Document analysis can allow for longitudinal analysis (Bryman, 2016). In my case, I had the opportunity to analyze documents as far back as the OERu had published them. I chose to go as far back as 2016 (except for referring to documents about the OERu's origins) because that was an active year in terms of the number of meetings held for planning and course development. Dooney and Kim (2017) recommended setting a time limit for the start and ending of data collection of editable online content. These authors indicated that online pages are living documents whose content can change at any time and can stimulate researchers to want to continue collecting data. While the OERu discussion forums and WikiEducator planning pages saw low participation throughout my study, the page views of these documents increased regularly, as did the views of LiDA103 pages, particularly when the course was live. Despite the risk of changing content, I was firm with ending my data collection of LiDA103 after two weeks. I significantly reduced my examination of OERu planning documents when it appeared that I had sufficiently rich data; I continued to monitor documents until the 2019 International Partners meeting and Council of CEOs had ended. The reason was to examine whether the OERu made any changes to how it would develop courses through its network.

Besides analyzing the content of documents, one should assess the quality of documents according to the following criteria: Authenticity (genuine), Credibility (free of errors and distortion), Representativeness (typical? If not, how atypical is it?), Meaning (is the evidence clear and comprehensible?) (Scott, 1990, p. 6). In addition, Bryman recommends considering the emotional state and motivations of the writers. This framework can be applied to the OERu's documents as a whole in that they are genuine, barring the possibility that someone hacked an account to edit content in WikiEducator under a pseudonym. The documents are highly credible, especially in examples such as meeting reports that are accompanied by a video recording. The reports are not verbatim transcripts of the recordings; they are a detailed summary. Additionally, interviewees corroborated much of the general document content and participated in editing it, though I have

removed identifying information to this effect in my reporting. The documents commonly contain errors because many of them are not formal documents and don't require that level of attention. The documents created by the OERu CEO are definitely representative of how the OERu functioned, because he was involved in almost every activity that the OERu undertook and reported on most of them in his rigorous style due to the OERu's commitment to transparency. The meaning of the documents seems clear, however the OERu's true priorities and concerns are not easy to discover by examining them. One reason is the high volume of documents. Another reason is that much of the documentation was about ongoing processes without a main page to show the OERu's major accomplishments, save for the courses shown on the OERu's official site: https://oeru.org/courses/. Additionally, the only record of high-level meetings, such as the Council of CEOs, is a written report with no accompanying video. Thus, I was aware of some of the politics involved with the writing of each document when I interpreted them.

Document analysis has some advantages. It is unobtrusive, since it doesn't require participants to give up their time or information (Bryman, 2016; Yin, 2014). Additionally, archived posts in chatrooms and discussion forums are not influenced by an interviewer (Bryman, 2016). Documents can contain detailed information (Yin, 2014), and I found this point to be true for documents from all institutions in my research. Documents can provide insight into a variety of situations over a considerable length of time (Yin, 2014) which was true especially for OERu documents. Document analysis also exposes the researcher to the vocabulary and expressions used by the participants who produced or interacted with the documents (Creswell, 2014). Some documents can be accessed at any time (Creswell, 2014) and repeatedly (Yin, 2014), and this was the case with the online documents in my research. I could examine documents as long as I wished. However, I did have some challenges to URLs being deactivated, such as those of the open source Kanban boards for planning the design of the LiDA course (Chapter 6). Another risk was that many pages were editable, so the content could change. However, with wiki pages, I could revert to an older version if I needed

to recover content I had analyzed previously. In contrast, content on websites outside of WikiEducator could be changed without my having access to older versions. Documents represent data that participants interacted with (Creswell, 2014). In my research, it was easy to examine who had edited the documents and how frequently. Where the documents are in text form, they reduce the burden of transcribing content (Creswell, 2014). Given the online form of most of the documents I encountered, I could copy and paste information conveniently for data analysis and reporting.

Document analysis also has several disadvantages. One disadvantage is that documents may lack authenticity or accuracy (Creswell, 2014; Yin, 2014). In the case of the OERu, anyone could change the content in WikiEducator using a pseudonym, but this risk was unlikely. If I did suspect that someone had made questionable changes to the documents, I could have emailed the OERu CEO to ask about their authenticity. The same applied to IIIU and EEEU: I could have contacted my research participants to ask them to verify the accuracy and authenticity of their institution's web pages. The greater risk for all online documents was that pages would be updated or taken down. Another issue is that bias may influence accuracy, such that what was documented did not reflect what occurred (Yin, 2012). Alternatively, the inability to capture every detail of an event results in documents that only reflect what its authors judged worthy of including (Yin, 2012). In the case of the OERu, video recordings that were embedded or linked in meeting reports helped to verify their accuracy. In addition, participants of meetings were invited to edit the meeting reports and all other documents on the site. Consequently, the content in the OERu's documents can be generally accepted as roughly accurate. Documents from IIIU and EEEU can be accepted as accurate to the extent that major errors could damage their reputation; there was a motivation to keep them up to date and accurate. A disadvantage of examining physical artefacts is that it's often not permitted to take them from the field and keep them for extensive examination (Bryman, 2016). Luckily, outside of my observations and interviews, my data collection occurred purely online, avoiding this issue. Further disadvantages are that not everyone expresses themselves in a similar way or in a similarly articulate

way (Creswell, 2014), leaving room for misinterpretation. Some information may be kept securely out of the public's reach (Creswell, 2014; Yin, 2014), though with the OERu's level of openness, most documents were accessible. In contrast, documents relating to IIIU and EEEU were not available except for those posted openly online on their respective sites. Document analysis can require the researcher to explore difficult locations to find (Creswell, 2014). In my research, I had to search deep within the OERu's extensive pages of planning documents and sometimes encountered difficulties retrieving documents I had previously located. For this reason, I created a database to help with navigation. Some materials may be incomplete (Creswell, 2014), and this was the case with the OERu's documents since many of them were a work-in-progress as per the agile method of development.

A risk with collecting documents is that it is possible to collect too much data (Yin, 2016). Bryman (2016) highlighted social media as presenting this problem. Considering the large volume of pages on the OERu's site, and the vastness of the internet in general, it was extremely easy to collect documents. A disadvantage is that it takes time to read the content to decide if a given page is worth recording and analyzing (Yin, 2016). This occurred and was compounded by the vastness of material on the OERu's planning pages. Consequently, I was distracted from discovering one of the OERu's most valued products: the NGDLE. I learned about how important the NGDLE was to the OERu in April 2018, late in my data collection phase. Consequently, I adapted my analysis to expand the focus on the OERu's OEP of working with open source technologies. As for the OERu's social media, posts were few and far between, with little retweeting and replying. The largest flow of tweets occurred during events such as face-to-face international OERu meetings which only occurred annually. Thus, awareness of an institution's prioritized activities shapes and narrows the researcher's search for documents.

To manage the volume of data, Yin (2016) suggests quickly examining the material to determine how much there is; how difficult it is to access the content; and whether a sample is enough, or if the whole of the data is required. He recommends conducting a preliminary data collection followed by a quick review before deciding how to proceed with further data collection. I roughly applied these suggestions. I began by examining OERu pages starting from the main planning page shown in Figure 4.3.

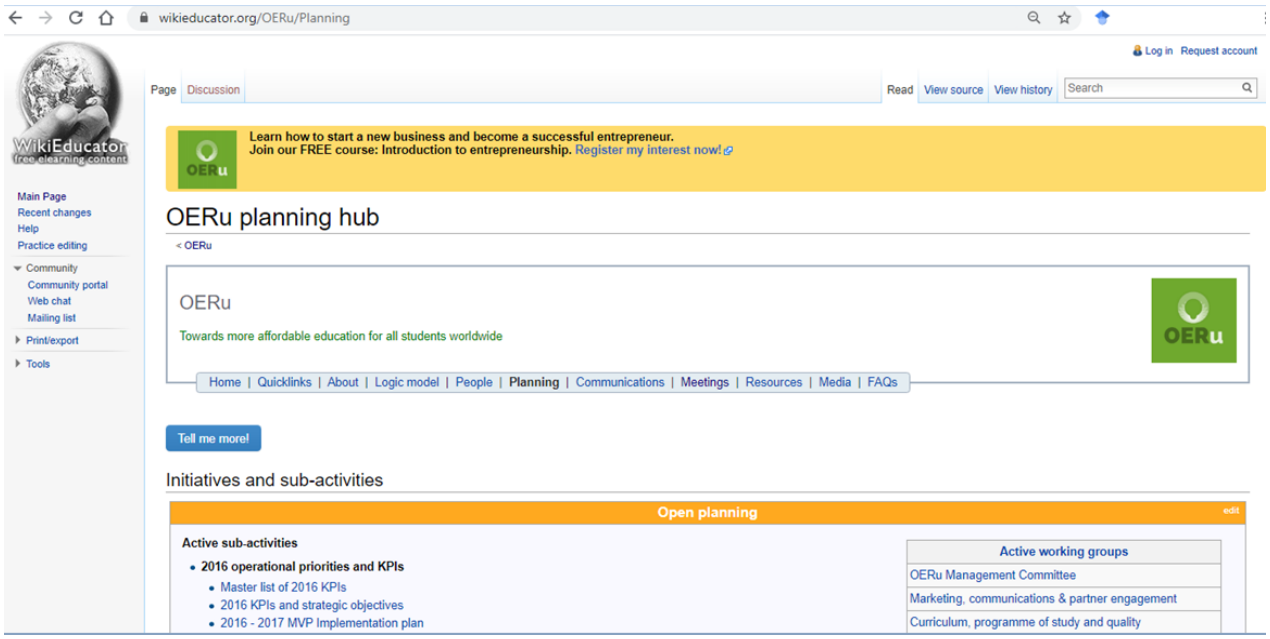

Figure 4.3. OERu's home page for planning documents on WikiEducator. Screen capture taken on November 8th, 2019

Following the advice of a supervisor, I created an Excel sheet to take notes about the pages I visited. I logged information such as the URL of the pages and the URLs of those linked to them, effectively creating a breadcrumb path of interconnected web pages. I also provided a summary of the web page content using my words or text copied directly from the page. A portion of this Excel sheet is shown in Figure 4.4. While I had full access to the content at any time, it was easy to get lost in the pages. Thus, difficult navigation impeded access. While I recorded the pages I visited, I knew I would not analyze all of them. Those that I selected pertained to course design, development, and delivery and to planning meetings from 2016 up to the end of 2019.

	A	B	C	D	E
11	**Topic**	**Link #**	**Link**	**Where I found the link**	**Description or summary of info found at the site**
12	Open planning	4	http://course.oeru.org/2016-meetings/	This link is provided in link #3	This is the welcome page of the 2016 International partners meeting 
13					
14					
15	Open planning	5	http://wikieducator.org/images/6/68/OERu_strategic_plan_2015-2017-Fin-Approved.pdf	This pdf is provided in link #4	OERu Strategic Plan 2015 – 2017
16					Vision, mission
17					Description of the Evergreen Planning Approach
18					Goals, objectives, KPIs in great detail including risks, explanation of objective attainment, strategic approaches, and 2015 Operational considerations
19	Open planning	6	http://wikieducator.org/OERu/Planning/OERu_2016-10_draft_agenda	This link is provided in link #3	This site contains Key points about the agenda including explanations about how the OERu conducts open meetings, how to add items to the agenda using the wiki, how to use the wiki to discuss the agenda, and how to create an account in the wiki.
20					The agenda contains points about administrative issues, marketing, analytics, and transnational accreditation.
21	Design and development of courses	7	http://wikieducator.org/OERu/Planning/Develop_an_OERu_partners_manual/Brainstorm_and_discuss_provisional_table_of_contents_for_partners_manual	This link is provided in #5 (pdf) and site #49	This site is to plan the development of a partners' manual
22					OERu/Planning/Develop an OERu partners manual/Brainstorm and discuss provisional table of contents for partners manual
23					1 What is the OERu?
24					2 Key Features of OERu Courses:
25					3 Course Contributions for OERu
26					4 Design and Development of an OERu Course
27					4.1 Team Composition
28					4.2 Development Tools
29					4.3 Collaboration and Communication
30					4.4 Resources
31					4.5 Learning Design
32					4.5.1 Templates
33					4.5.2 Sample Courses
34					4.5.3 Resources The OERu
35					4.5.4 References
36					4.6 Notes

Figure 4.4. Section of an Excel spreadsheet used to log my document analysis.

In the pilot study, I collected online documents regarding design, development, and delivery of open courses for the OERu. I mostly explored the OERu's planning pages (https://wikieducator.org/), published courses and organizational documents (oeru.org), and the LiDA micro-course (https://course.oeru.org/lida103/). I examined the content pages of three OERu courses, (explored in the "foundations" section of Chapter 6), two of which informed my writing of the interview questions. I collected documents that described the OERu and how it functioned as a network. I collected minutes of four meetings of OERu administrators to determine the kinds of decisions they made about advancing open education. In the main study, I collected documents describing resources that faculty used for guiding course design, development, and delivery. I examined the websites of each participating institution to determine what they advertised in terms of open education offerings and to determine how they described the university environment, values, and cultures.

Data Analysis

The inductive process

I analyzed the findings using approaches based on thematic analysis (Ayres, 2008; Gibson & Brown, 2009; Hawkins, 2017) and analytical memos (Mills & Morton, 2013). The steps in such an analysis are reading field notes repeatedly, coding the notes, looking for patterns to establish themes, combining data within those themes (Creswell, 2007; Mills & Morton, 2013), and representing the findings using text or diagrams (Creswell, 2007). I analyzed data as I collected it. I copied interview transcripts into NVivo and read, re-read, and color-coded my data to classify it into emerging themes. I sought correspondence and patterns in the data. Throughout the process, I used codes that were relevant to my research questions. However, I often needed to change or re-organize them. My process was partially informed by the four stages of constant comparison (Merriam & Simpson, 1995). In the first step, I compared data items and generated categories and codes using initial coding (Bryman, 2016) with highlighting and fonts of different colors. I wrote memos to analyze the data associated with a code. I began the coding after transcribing my first set of interviews from the pilot in November 2016. This first step of coding continued until my last interview during the main study in December 2017. Some of my early codes are shown in Figure 4.5.

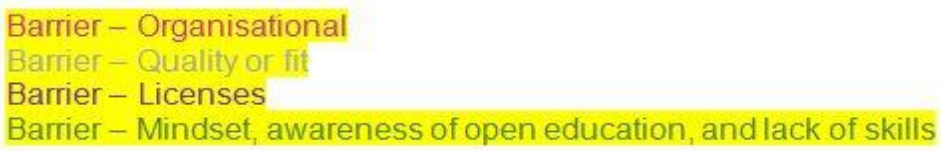

Figure 4.5. A sample of a color key for coding data from my pilot study

An example of interview text coded as "Barrier – Licenses" was from Rory's interview, where he said "To extract yourself from these licenses, all the old material and finding the authors, and who own it - is it the university, is it the college, is it the author? It's a huge job." Rory was referring to challenges related to openly licensing materials that were of interest but that pre-dated CC licenses. The following quote from Wayne_AD was given two codes. The plain text was coded as "Barrier – Mindset, awareness of open education, and lack of skills", and the text in boldface was coded as "Barrier – Organizational":

> The big challenge is building capacity and training people in how to function in these open environments. They don't have that knowledge and experience. That's a big

> challenge. **The second biggest challenge in this space is the cultural change that is necessary for working in open environments. It's a very different culture to the traditional models of the academy which are very individualistic, and where one is rewarded for working alone. The academy doesn't necessarily reward collaborative work in that way.**

In this quote, the OERu CEO was describing several different barriers that impeded people from engaging with OER. The code for the plain text consisted of three sub-codes: mindset, awareness of open education, and lack of skills. These were each a further subset of "Barrier" codes that I had merged as they were elements that all impeded individuals from engaging with OER. Though code merging is considered to be a part of step two, I classify this merging process in step one. The reason is that I was in the process of experimenting with and determining my initial set of codes during the pilot phase.

In step two, I compared data items and codes and re-analyzed and re-organized them as necessary to identify the most meaningful codes using focused coding (Bryman, 2016). I completed this step with findings from interviews in my pilot study in time to present a poster on my emerging findings at the ASCILITE conference in Adelaide in November 2016. This work was rushed, so I repeated this step for the pilot study interview data while integrating data from the interviews from my main study in an iterative fashion. A late-stage set of codes consisted of: Barriers, Enablers, Open or closed approach, Open pedagogy, Social learning, Tech Issues, Organizational values, Open design and development. The analytical process requires reflection to question why different themes emerge (Mills & Morton, 2013). Thus, as I reported on the findings, the codes changed again into the topics found in the current version of this thesis. For example, all of the content coded as enablers and barriers was re-organized according to the OER adoption pyramid. The barriers and enablers were called "stressors" as per ecological terminology used in the Arena framework. These codes corresponded to my second guiding sub-question about stressors involved in OEP implementation.

Steps three and four refer to theory generation, which was not my aim. My approach was to write analytical memos (Mills & Morton, 2013). To this end, I wrote summaries for each code that I had decided were worth conserving based on relevance to my research questions and richness of the data. I formed meaningful links between codes and added interpretive comments. I used thematic analysis, which examines the content of what is said. It requires the researcher to be attentive to the information presented by the participants, their context, and the understanding they have of their roles in that context (Bryman & Bell, 2016). The researcher is not only interested in the account related by the participant, but more importantly, in the meaning the participants make of it (Bryman & Bell, 2016). That is, the researcher is interested in the participants' perspectives of the event in question, or in line with my research, the case under examination. To illustrate, in examining the words of the OERu CEO or Rory, I needed to take into account their position as people with extensive knowledge of OER and with a commitment to promoting OER among institutions. When interpreting Wanda's words, I took into account her expertise in educational technology, as well as her emerging level of knowledge of OER.

When writing memos, the findings can be represented using text or diagrams (Creswell, 2007). My examples below illustrate my analysis of interviews and the LiDA103 course. Writing analytical memos requires reflection to question why different themes emerge (Mills & Morton, 2013). The analytical memo also consists of reflecting on the findings and adding notes of variable length to establish links between them and the literature, to summarize patterns, and highlight important themes (Mills & Morton, 2013). To manage my data, I used a system of detailed and descriptive folders and files, which I copied onto backup drives. To illustrate the process I used to analyze data from my interviews, I collected all the data on the same theme from each interview and organized it in a table. The table captions contained the theme and the names of the interviewees who had discussed it. In each row, I selected two interviewees and pasted content from their interviews that coded to correspond with the theme. I examined the quotes and looked for similarities, differences,

varying perspectives, possible motives, and possible positions (i.e., OER expert vs. novice, proponent for OER in general vs. proponent of particular OER for the institutions' own students). I then noted some thoughts, which I labeled with "MY COMMENTS". I repeated this process for all possible pairs of interviewees, set the document aside for several days and then repeated the analysis. Once I felt that there were no new comments to add, I wrote a summary of all the data pertaining to the theme.

Another illustration of my analytical process refers to my observation of LiDA103. The coding and commenting I did is shown in Figure 4.6., where the first column contains copied-and-pasted information from LiDA103 about the respective session in the course. The second column from the left provides more information copied from the course about the intended learning activities. The next two columns contain codes I created for each web page in each session. The final column on the right contains my notes and comments on the pages. Initially, I took notes about several topics: learning objectives, the structure of the sections into sub-sections, instructions to the students, types of student-student interactions. As my analysis progressed, I increasingly referred to these notes to examine the frequency and nature of each type of student-student interaction (i.e., social annotation, discussion forum, use of WENotes) and which sub-section of the course where I could find them for further examination. The data from this course analysis were integrated into memos and condensed to make evidence clear for arguments in the chapters about the findings.

Session and objectives	From the syllabus	Code for reference in during analysis	Code for corresponding WikiEditor page	Sub-sections	Summary of and notes on content
Familiarise yourself with the course site and establish your personal learning environment. Dates: Independent study before the course starts Learning materials: • Start here. • Establish a personal learning environment. Key activities: 1. Work through the learning materials for this learning pathway 2. Complete the OERu new participant survey (optional). 3. Establish your course blog and declare yourself to the group.	**Session 0 Orientation** Independent study before the course starts Instructions: Establish a personal course blog and declare yourself.	LiDA103_0_1_1	LiDA103_0_1_1_WE	1. Overview	Welcome message List of technical skills required for participating in course • Maintain a personal course blog • Post annotations using Hypothes.is • Post and reply to discussions on forums.oeru.org • Share resource links on bookmarks.oeru.org • Post "toots" on mastodon.oeru.org Objective Web resources
		LiDA103_0_1_2	LiDA103_0_1_2_WE	2. Join mastodon	• Introduction to Mastodon • How to use Mastodon
		LiDA103_0_1_3	LiDA103_0_1_3_WE	3. Start – Declare yourself challenge	• Info guiding process of setting up a blog • Purpose of the task is explained
		LiDA103_0_1_4	LiDA103_0_1_4_WE	4. Tasks – Declare yourself challenge	• Detailed instructions for creating a blog • Instructions about what to post • Students are asked to reflect on the process and provide tips for future learners • Students are to invite others to comment on their blog
		LiDA103_0_1_5	LiDA103_0_1_5_WE	5. Outputs – Declare yourself challenge	• Students are asked to write another blog post, this time to introduce themselves • The post must contain at least one link, a category or tag. • The student needs to receive a comment • The student needs to register the blog url
Discuss the implications of why open matters for learning in a digital age. Dates: **Wednesday 9 May 2018** Learning materials:	**Session 1 Why Open matters** **Wednesday 9 May 2018** • Explain the importance of sharing	LiDA103_1_1_1	LiDA103_1_1_1_WE	1. Overview	• Introductory paragraph, photo, quote • Objectives
				2. Video signpost	• Meet Stephen Downes • WENotes - Share your thoughts on Stephen's video signpost
				3. Freedom to learn	• Content, quotes, photo

Figure 4.6. Table of observations organized according to the sections of LiDA103

According to Creswell and Poth (2018), constant comparative analysis should lead to themes that have been analyzed until saturation. Saturation occurs when analysis stops producing new data, when the themes are explored fully, and when relationships among the themes are formed (Morse, 1995). Two additional measures determine if saturation has been attained: code saturation, where the researcher decides that there is no new data to uncover (up to approximately nine interviews), and meaning saturation, when the researcher decides that there is nothing new to understand (requiring 16-24 interviews) (Aldiabat & Le Navenec, 2018). These numbers should not be strictly adhered to, but rather used as guidelines. A study with greater scope than mine would be necessary to meet the expectations of these definitions of data saturation. Given the depth of the analysis, I judged that I had attained meaning saturation. The analysis included writing document memos, which involved analyzing data relating to one or more questions and summarizing the data, comments, and literature references (Creswell & Poth, 2018).

To highlight the purpose of constant comparative analysis,

> The goal is to construct a plausible and persuasive explanation of what is transpiring when the emergent themes are considered together, recognizing again that all explanations are partial by nature, and there are always multiple ways in which experiences and/or phenomena can be explained (Butler-Kisber, 2018, p. 47), (p. 47).

This quote is significant in that it explains that the analytical process involves a re-interrogation of both the findings and the process for analyzing the findings at each step of the way. During this process, the argument of the thesis emerges, is challenged, and is redefined while the researcher tends toward developing a conclusion. However, this point is not to indicate that my analysis ended at this stage. In the next section, I will explain the second part of my analysis, which was deductive. Whereas inductive reasoning starts with data collection and leads the development of theoretical knowledge, (O'Reilly, 2009), deductive reasoning begins with a theory or rule. A researcher makes an observation, and if it fits with the theory, it leads to a conclusion (O'Reilly, 2009).

The deductive process

My analytical process became deductive when I applied my theoretical frameworks to my findings once they were organized into themes. Table 2.1. presents the components of my theoretical framework, the topics they were used to analyze, and the purpose for each type of analysis. In deductive analysis,

> systematically collected data using naturalistic methods and very open-ended techniques can be analyzed using codes and variables from existing theory. The coding and counting techniques, data display, and data reduction methods described above can then be employed to "test" hypotheses or theoretical fit. Findings may confirm or disconfirm theory, but the test is in the form of language and text rather than probability data (Drew, Hardman, & Hosp, 2008, p. 348)

In my research, the purpose was not to test the fit, though I did question the fit regularly. The purpose of the theories was to increase my understanding of the case of OEP at the OERu, at IIIU, and at EEEU, as well as the stressors that influence OER engagement and OEP implementation. In turn, the new knowledge was used to provide models for planning for further open education innovations.

Each of the individual frameworks served a purpose in my analysis. I used Davis' (2018) Arena as a framework to explore the relationships among the roles and resources (species and non-living matter) within each institution's whole system. This ecological study was done to examine practices that were sustainable or not, how technology and educational practices co-evolve, and how they could become more sustainable. Increased sustainability allows a system to evolve in a desired manner, where species implement OEP and engage with OER. Overall, the Arena was used to increase my understanding of the OERu's, IIIU's, and EEEU's systems when engaging with OER and implementing OEP. I used Cox and Trotter's (2017b) OER adoption pyramid to organize the barriers and enablers (stressors) according to a hierarchy where attainment of one layer facilitates attainment of the next higher one. The stressors were then plotted on diagrams of Davis' Arena. The purpose of this analysis was to gain an understanding of how stressors influence processes of OER engagement and OEP implementation across the system. I used typology and language from Cameron and Quinn's (2011) Competing values framework (CVF) to seek out indicators of organizational cultures at the second layer of Schein and Schein's (2016) framework (level of espoused beliefs and values). I also used the CVF to detect signs of the dominant organizational culture regarding particular functions such as using open communication methods for holding and documenting meetings. The typology and vocabulary related to the "Clan" is shown in Figure 4.7. The full table relating to the four cultures of the CVF is shown in Appendix 2. Overall, I used this theoretical framework to provide a model for guiding innovations in OEP implementation and OER engagement in a sustainable and strategic fashion.

Culture	Values, as per the opposing values framework	Key words and phrases to describe the culture	Leadership and other characteristics to describe the culture
Clan	**Internal focus and integration** Internal orientation Integration Unity Harmonious internal characteristics Ex. IBM & HP **Flexibility and discretion** Organisational versatility and pliability Flexibility Discretion Dynamism Changing, adaptable Organic Ex. Microsoft, Nike	Values: Cohesion, participativeness, individuality, sense of collectivity Characteristics: teamwork, employee involvement programs, corporate commitment to employees, Evidence: semi-autonomous work teams that receive awards based on team accomplishments, seeking feedback and ideas from staff Assumptions: teamwork and employee development are the best means for managing the environment, must develop a humane work environment, must empower employees and facilitate their participation, commitment and loyalty. Leaders are seen as mentors. "When rapidly changing turbulent environments make it difficult for managers to plan far in advance and when decision-making is uncertain, it was found that an effective way to coordinate organizational activity is to make certain that all employees share the same beliefs, values, and goals Loyalty, tradition, commitment are high. The organisation emphasises the long-term benefit of individual development, with high cohesions and morale being important. Premium: teamwork, participation, consensus.	Leader: facilitator, mentor, parent Effectiveness criteria: cohesion, morale, development of HR Management theory: participation fosters commitment Good managers have these skills: Warm and supportive, parent figures, mentors, team builders, supporters, facilitators, nurturers. Ex. Disney Empowerment, team building, employee involvement, human resource development, open communication, "firms cannot treat customers any better than they treat their employees"

Figure 4.7. Terms used by Cameron and Quinn (2011) to describe the Clan.

Representation using vignettes

In my research, I used a writing form called the vignette in chapter 7 to reveal my findings and analysis regarding IIIU and EEEU. A vignette is a device for presenting findings that assists the reader in making sense of a lived experience or a case. Researchers use the vignette to present and analyze findings through their perspective and in a tangible manner (Blodgett, Schinke, Smith, Peltier, & Pheasant, 2011; Ely, Vinz, Downing, & Anzul, 1997; Langer, 2016; Spalding & Phillips, 2007). This use of vignettes is in contrast with that of hypothetical vignettes (Spalding, 2004) that can be as short as a paragraph. Hypothetical vignettes are used to collect data by stimulating participants' thinking (Spalding & Phillips, 2007; Langer, 2016). The process of writing a vignette involves questioning the findings when a researcher discovers gaps, needs more detail, or finds contradictions that require resolution (Ely et al., 1997). It is considered to be a trustworthy form of presenting findings (Spalding & Phillips, 2007). Vignettes can be validated by allowing participants to revise them while they are in development, or by allowing for member checking once the vignettes are finished (Spalding & Phillips, 2007). Despite these procedures, readers may each interpret the findings differently (Spalding & Phillips, 2007). Vignettes are similar to anecdotes in providing a narrative description of a person or situation. However, a vignette is more elaborate: it presents a complex synthesis of

perspectives based on data collected over time. A vignette is also the result of findings that have been examined and thought over repeatedly (Ely et al., 1997). In my research, the vignette method was used to examine IIIU and EEEU because the scope of those studies was small. It involved only two participants and one participant, respectively, and revolved around a narrow set of activities: the design and development of a an openly licensed course.

4.5. Strategies for validating findings

I applied methods to increase the qualitative validity - or credibility or accuracy of findings (Creswell, 2014) - and reliability (or consistency) of applying the methods across my research (Creswell, 2014). Research has internal validity when the researcher correctly draws inferences from the data. In other words, the methods help to collect and interpret the data in such a way that they reveal that which they are intended to reveal (Creswell, 2007). According to Creswell and Miller (2000), some methods for increasing research trustworthiness are disconfirming evidence, triangulation, rich and detailed descriptions and member checking. A researcher uses disconfirming evidence by stating and refuting counterarguments or by disproving evidence to the contrary. To use this approach requires the researcher to consider several perspectives and to acknowledge the complexity of reality (Creswell & Miller, 2000). In this research, I verified my data from different sources and consulted the literature for arguments and counterarguments to objectively support my arguments.

Trustworthiness increases with thick, rich, sensory-based descriptions. They are provided in addition to facts alone and give the reader a sense of what it is like to be in the described context. The descriptions can be of the location, events, behaviors, and feelings, for example (Creswell and Miller, 2000). Findings about the physical sites of the institutions I studied were based on participants' descriptions that were synthesized. Trustworthiness increases by using triangulation, which consists of analyzing data from different sources and methods and checking for consistency (Creswell & Miller, 2000). In this research, triangulation involved checking data from interviews, observations, and document review against each other. It also involved checking findings from interviews with

some participants against those of other participants for inconsistencies and nuance. In the pilot study, it was a matter of checking the OERu CEO's interviews in different roles (e.g., course developer vs. administrator) against each other, for example, to verify whether he contradicted himself at any point. Comparing field notes of observations to documents, such as minutes of meetings and interviews, is a method for checking the reality against what the participants may commit to doing in meetings or report in interviews. Another approach to increasing trustworthiness was to have my transcripts verified by the respective interviewees. I carried out member checking by emailing the transcribed interviews to the respective interviewees and having them verify the work (Creswell & Miller, 2000).

By exposing my professional experience and my implicit bias towards OER in the first chapter of this thesis, I increased the trustworthiness of this research (Creswell, 2007). By shedding light on my bias, I allowed the reader to contextualize my research and read my findings with greater awareness (Taylor et al., 2016). My bias was not a blind one, as I was aware that the adoption of OERs and the implementation of OEPs are complex processes. They carry advantages and disadvantages that vary with each institutional context, time, and circumstances. My bias and roles will be further explored in section 4.7.

Turning to the topic of external validity, this process is not well suited to qualitative research, which is intended to describe particular situations. That is why analytic generalisation is applied in this research instead. When my case study is considered alongside other similar case studies, it is hoped that it will lead to general conclusions (Creswell, 2014). Therefore, with this research, I provided case studies of institutions that are implementing OEPs in different ways.

4.6. Ethical Issues

I submitted a research proposal to the University of Canterbury Educational Research Human Ethics Committee for Ethical Approval before conducting interviews. After the pilot study, I submitted

applications to amend the proposal to account for new research steps in the main study and again as necessary for subsequent modifications to my research plan. One change was the addition of participant observation of LiDA103. Having obtained approval from ERHEC, I sent consent forms to my research participants. They included information on the study's purpose and data-gathering methods, methods planned for protecting their identity, possible risks for them in joining this study, their right to withdraw from the study at any time, and space for the respective participant's and my signature as recommended by Creswell (2007). As per Creswell (2007) I avoided deceptive and covert research by discussing my research with key informants and having them introduce me to prospective interviewees via email. Member checking of my interviews by the participants also prevented deception. So did my public sharing of work produced for conferences and messages I wrote on the OERu's discussion boards regarding my research. With regards to deception by participants, in online research there is a risk of sharing false information, including information related to identity (James & Busher, 2012). In my research, the involvement of a key informant again helped to prevent such a problem from occurring. Still, I had at least one face-to-face or video conversation with each participant to increase the trustworthiness of my findings.

To ensure confidentiality, I assigned pseudonyms to the participants except for those who preferred to be identified. When identifying information such as a person's name, email address, or other information appeared in a screen capture, I masked it with digital ink. Two exceptions were Dr. Wayne Mackintosh, who was a proponent of openness in everything he did on behalf of the OERu, and Dr. Rory McGreal, who asked to be identified. The openness of the research with regards to these participants showed their commitment to openness and transparency. Their openness reflected their interest in being accountable for the comments they made publicly. It also held my research accountable in representing them and their words reliably. This interest in openness is a privilege that not everyone can enjoy. Some participants asked me to be very careful about keeping their identities confidential, and I respected this request to the extent that I have avoided including

some data gathered from them. Some of these participants were concerned that their views would be controversial and perceived as negative or harmful. Thus, there were risks for them and their reputations. I readily and enthusiastically agreed to meet these requests, because it was more important to make my participants feel safe than it was to report richer content. I kept information on physical storage devices that I was careful to use while not leaving my computer unattended, and otherwise kept locked safely. I used the University of Canterbury's servers for storage of backup copies of my work (Creswell, 2007).

In return for the time that the participants spent providing me with information, I acknowledged them as confidential (or named, as requested) participants in my publications, and sent them copies of my publications, as per Mills and Morton (2013). The participants could also benefit from the research by applying its recommendations in their institutions. I informed the participants about my reasons for choosing their university, the actions I intended to take, how disruptive my actions would be, how I would report the results, and what they would hopefully gain from the study (Creswell, 2007). To build trust and rapport, I informed the participants of my professional background and answered questions they had about the research (Creswell, 2007). I also reassured the participants that the research was about the implementation of OEPs focusing on course design, development, and delivery. The aim was to clarify that I was not asking them to comment on their colleagues. I further reassured the participants by informing them that I would provide them with the opportunity to filter the findings in case they were uncomfortable with anything that I had documented. The digital materials developed in my research were openly licensed. I took particular care to share the materials in an ethical manner and informed the participants of the work being shared.

4.7. Role of the researcher

I took on several roles over the course of this study. In the pilot study, I acted as a researcher and as an observer of recorded videos of meetings. In the main study, I was a researcher, and

simultaneously, a volunteer facilitator and participant-observer of an online micro-course. When adopting multiple roles in a study, it is necessary to be clear about which particular role one is adopting during the data collection process (Roberts, 2007). One reason is that the participants can better understand their role in the research and how the information about them is being used. Another reason is that participants can cooperate in a way that is beneficial for the study so that the researcher can more effectively answer the research questions. The role also needs to be made clear in the research reporting so that the reader can understand the perspective from which the researcher is writing. Roberts raised the additional concern that a researcher's multiple roles can become blurred or confused. For example, as a volunteer facilitator, I could have involved myself too much in learners' discussions and forgotten my role of participant-observer. When I took on these roles, I was conscious of which role I played at which time. I had been made aware of the risks of confusing multiple roles early on in my research.

While I was able to remain clear about my role at all times, my role as an outsider of the OERu, and as a student researcher had an influence on how I communicated my research. In addition, the depth of the examination of the OERu and its processes, culture, and interactions placed the OERu in a potentially vulnerable position. Actors in the open education community do not always welcome nuanced views about openness. Kelsey Merkley indicated as such in her keynote speech (Creative_Commons, 2019) at the Creative Commons Global Summit in Lisbon, Portugal in (2019). She commented that there were negative, damaging consequences for those whose views might be different from those who laid the foundation of open source software. Since Merkley gave this speech, my awareness of tensions forming in communications through open education email lists that I participate in has been heightened. These tensions seem to be due to diverse views on how to apply processes and how to communicate in equitable and inclusive ways. I have therefore striven to put my personal views about open education to one side. This was to ensure that my reporting of an organisation that is based on open education and open source software not be critical in a

derogatory sense. For these reasons, the findings in chapters 5, 6, and 7 are grounded through the application of the theoretical framework described in Chapter 2. I have aimed to provide sufficient detail in the findings chapters and in the conclusion chapter to allow readers to come to their own conclusions about the data I collected.

4.8. Conclusion

I described my methodology by first explaining the paradigm, ontology, and epistemology of my study based on their relevance to my research questions. I provided an overview of my ethnographic case study design which focuses on the case of the OERu's implementation of OEP. This case breaks down to include data collected about the OERu from participants who are a part of that organization and who are a from the OERu's Partner Institutions. The case also breaks down into vignettes of IIIU and EEEU and their implementation of OEP as pilot projects completed for the OERu. Following this overview, I examined ethnographic case studies on topics related to mine. I compared these studies with the current one to validate my research design choices.

I provided a detailed explanation and justification of my research methods in the context of indications provided by the literature. I described my participants, explained the data collection methods and provided samples of data to clarify how I had applied my research design. I described my data analysis methods, which included an inductive process to arrive at themes of findings that corresponded to my research questions. I used a deductive process to analyse my findings through the lens of my theoretical framework. I described my methods for validating my findings and for obtaining ethical approval to conduct my research. I explained the roles that I adopted as a researcher, and I explained how my role influenced my method of analysing and describing my findings in the three subsequent chapters.

Chapter 5. Overview of OERu analyzed using Davis' (2018) Arena

This chapter is the first of three to present findings and is intended to answer the third guiding sub-question: **What is the typology associated with the organizational cultures of the OERu?** More broadly, this chapter aims to be far more descriptive than analytical; it is necessary to describe the OERu since it is such an unusual organization due to its extreme openness. This chapter provides a basis of knowledge that is necessary for understanding the findings of Chapters 6 and 7. With this aim in mind, this chapter begins with a synopsis of the case study research which summarizes the case of OEP at the OERu, at IIIU, and EEEU, the aim being to situate all three institutions within the embedded single-case of my research (section 5.1). However, following this synopsis, the chapter is aimed at describing the OERu's case of OEP only. I will refer to IIIU, EEEU, and other PIs and my participants from these institutions to the extent that it is beneficial in providing a rich description of the OERu and its OEP from multiple perspectives. The remainder of the chapter describes the aspects of the OERu that provide a context to Chapter 6 while being analyzed through the lens of the Arena framework. The OERu's organizational structure is described to provide a background for how its employees, Partner Institutions (PIs) and organizational groupings relate to each other (section 5.2). Further, the roles and resources of the OERu's Arena are mapped onto a diagram and analyzed (section 5.3). The roles and resources will be referred to collectively as matter. The roles may be called as such, they may be called species, or I may refer directly to the specific role in question. The aim of the Arena diagram is to provide a summary of the complex relationships that existed across the OERu's global ecosphere. It highlighted key roles and concepts (bridging across ecosystems, educational or technological evolution, etc.) using theory based on human ecology (Davis, 2018). The OERu's ideology (aims, mission, vision) (section 5.4); and its application of open philanthropy and open communication (section 5.5) are described both in terms of the Arena and the typology of the CVF. The examination of parts of the OERu and its processes is necessary to understand what kind of organization is capable of the type of work it does as described in Chapter 6. A cursory examination of its organizational cultures provides insight into how the OERu operated and what it valued as an

institution; these are also findings that enrich the understanding of what drove the OERu so that it engaged with OER and implemented OEP the way it did. While this chapter provides context for Chapter 6, where the OERu's OEPs are related to open course design, development, and delivery, it also partially contextualizes chapter 7. That chapter contains two vignettes of OERu Partner Institutions (IIIU and EEEU) and describes how they implement open educational practices and design and develop courses.

5.1. Overview of the three cases in the current research

This chapter begins the examination of the single ethnographic case study of the process of implementing OEP at the OERu and presents an overview of the OERu as well as the embedded vignettes of IIIU and EEEU. The OERu was an organization that led a network of global tertiary academic and non-academic institutions while promoting open resources and practices for the benefit of students excluded from traditional tertiary education systems. The OERu designed, developed, and delivered openly licensed courses and supported its partners in doing the same while providing them with technical support in using open source tools or incorporating them into their technological infrastructure. The OERu built capacity by providing professional development and just-in-time support for developing courses, most often in the WikiEducator platform. It also arranged for accreditation of courses and inter-institutional recognition of formal academic credit by partners within the OERu network. The OERu provided open source platforms for developing courses and communicating online as well as providing an ensemble of open source tools that supported student-student interaction. These tools and platforms were available to anyone with internet access. The OERu also offered informal credit through badges for its micro-courses (Wayne_AD).

The OERu was characterized by establishing itself as a global entity, which was unusual in tertiary education. It believed in and practiced open admission (no pre-requisites for language or subject matter restricted entry into its courses) and required no registration to explore course content; the

only cost for a student was for optional assessment and accreditation on a cost-recovery basis. Students could complete individual courses and take the amount of time they wished to do so. However, there were some exceptions, e.g., LiDA was launched on a schedule with the goal of a high amount of student-student interaction, so there were deadlines for students to complete learning activities and discussions. The OERu generally did not employ facilitators, instead relying on student-student interaction to support student engagement within courses. Once again, LiDA was an exception in that the OERu CEO has facilitated students in some offerings of this course. In addition, the OERu did not hire course advisors to guide students' choices in taking courses. This was not a case of a university; the OERu did not offer formal academic credit for degree programs. The OERu did not conduct academic research, have a library, or provide technical support to students; services commonly associated with tertiary institutions.

To clarify the chronology of the events examined in this research, please refer to Figure 5.1. The course design and development work examined in the current research was not concurrent; it occurred over a range of time. The work by IIIU and EEEU concluded several years before my study began. Design and development at IIIU began approximately six months prior to that of EEEU, and course developers took approximately one year at each of these institutions to complete one openly licensed course. Each of these course developments were pilot projects at the respective institutions. I am refraining from indicating the dates since such information can lead to identifying the institutions. In Figure 5.1, the boxes referring to IIIU and EEEU are dashed, indicating that their placement on the timeline is not accurate. The OERu began designing and developing LiDA in April, 2016 (OERu, 2017b) and ended its first cycle of development of LiDA in early 2018 before delivering each of its micro-courses starting with LiDA101 on March 14th, 2018 (Mackintosh, 2018). The OERu has since made updates to LiDA, as per its agile approach of frequently modifying content. As for the period during which I conducted research, my data collection began after obtaining ethical approval in late 2016 and ended at the end of 2019.

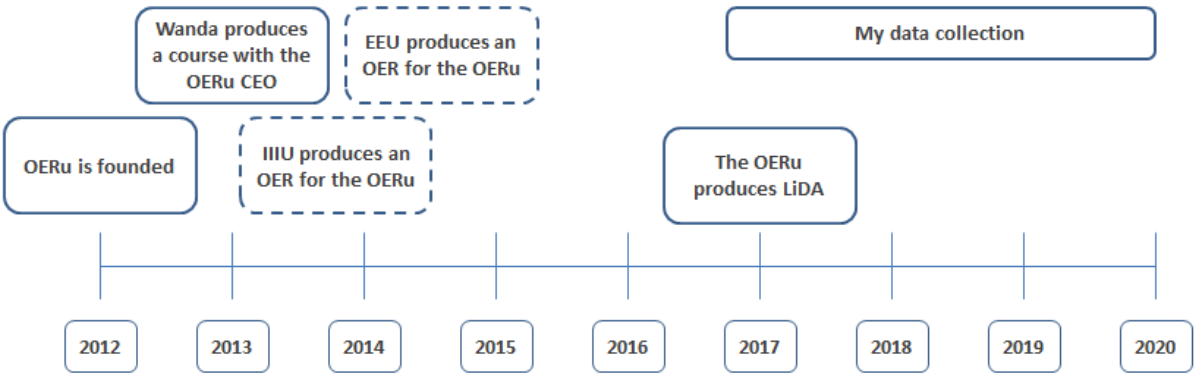

Figure 5.1. Timeline of the case studies and my data collection period

The Partner Institutions comprised 20 tertiary education institutions along with 8 non-degree-granting institutions (OERu, n. d.-f) as of March 2016. Staff from some of these institutions took on different roles to support the OERu. Examples are developing OER, convening or participating in working groups, participating in International Partners meetings or the Council of CEOs, responding to OERu surveys, and participating in the OERu's online discussions (OERu, 2016v). The Partner Institutions were located around the world, with almost half of them being from North America (OERu, n. d.-f).

The Venn diagram in Figure 5.2. depicts the OERu as a network composed of multiple international partners. Only the PIs relevant to the current research are depicted. The diagram indicates the chapters where each institution is featured primarily, and which topics are covered. The OERu is discussed in Chapter 5 in terms of its context (organizational structure, partial history); indications of its organizational cultures; and its OEPs of open source technology use, open philanthropy, and open communication. In Chapter 6, The OERu's OEPs of design, development, and delivery of an OER are analyzed, along with its stressors. Chapter 6 also mentions AU (Rory's institution) and contains an anecdote of OOOU (Wanda's institution). In chapter 7 are the vignettes and stressors of IIIU and EEEU. IIIU is the institution of Stephen, Samantha, and Trevor, while EEEU is the institution of John. The PIs were all located in different countries. An example of OEP implemented by PIs for their

students was accreditation offered for learning acquired through prior experience. OEPs involving the PIs and the OERu included the design and development of an openly licensed course and participation of the PIs in the OERu's meetings.

Since the establishment of the OERu in early 2011 (OERu, 2014a), it had a goal of developing exit qualifications. At the time of the case study, it was developing courses for a Certificate of Tertiary Education in Business and a Certificate of General Studies. Three courses that were a part of these certificates were published on the OERu's Course page (OERu, n. d.-b). In addition, one person had obtained credits for one course taken through the OERu (John_AD). The OERu also created 55 micro-courses and had 703 registered learners from 60 countries. As progress markers, these points indicate that the OERu was still growing as an organization. Its organizational cultures were also dominated by the founder, who was the OERu CEO, further suggesting that it was at early stages of development (Schein, 1990b). In contrast, IIIU and EEEU had offered courses and programs to hundreds of thousands of students over decades, including offerings of online education to international students located beyond their country's borders. Thus, they were considered to be well established and mature institutions (Schein, 1990b).

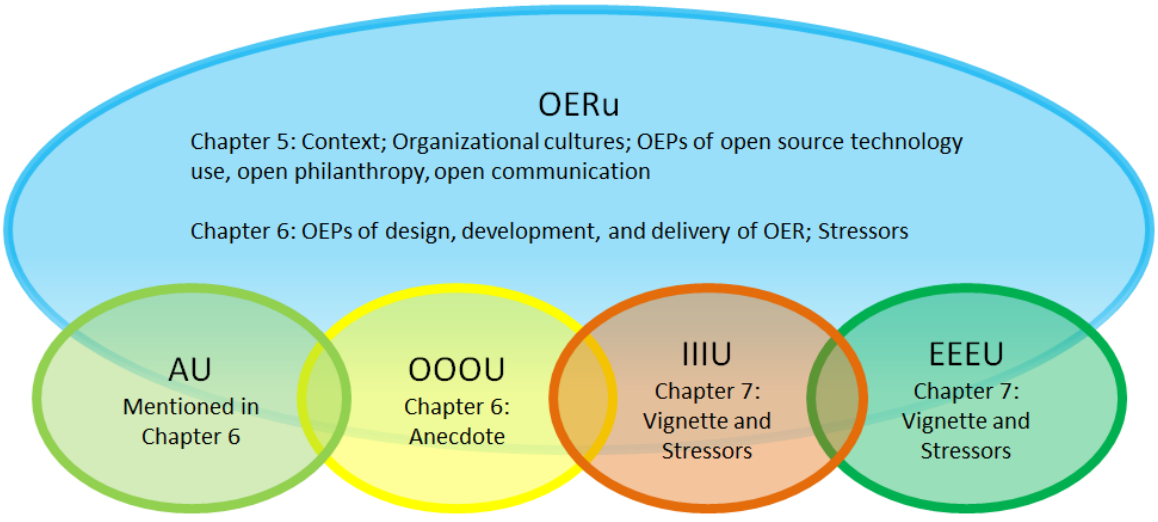

Figure 5.2. Representation the OERu and its PIs along with the topics covered in particular chapters

5.2. OERu's organizational structure and strategic planning

This organizational structure of the Open Education Resource universitas (OERu) and the roles within influenced how the Open Educational Practices of the OERu were implemented by particular roles, groups, and institutions. An analysis examines "how things were done", revealing what it meant for the OERu to have a culture dedicated to openness. Additionally, an understanding of the roles and the strong dedication to openness will help to better understand the kinds of OEP that were implemented when designing, developing, and delivering courses as examined in Chapter 6. A brief description of the OERu's parent organization, the OER Foundation (OERF) is provided for context. Also described for context are the Council of CEOs and the OERu's employees, working groups, and PIs. Figure 5.3. illustrates the relationships among these components as they existed in 2019.

Going from the top to the bottom of Figure 5.3., the OER Foundation had a Board of Directors and a Director (OERu CEO) who reported to them. The OERu was an OERF initiative, as was WikiEducator (OERu, 2018h), the platform that the OERu used for developing courses and organizational planning pages. The OERu was guided by the OERu Council of CEOs, which was composed of one or more administrators from a representative number of the OERu's Partner Institutions. The OERu CEO reported to the Council of CEOs and was assisted by an open source technologist (OST). These were the only two employee roles at the OERu for the majority of its existence. In late 2018, two Learning and Teaching Specialists were hired on a part-time basis.

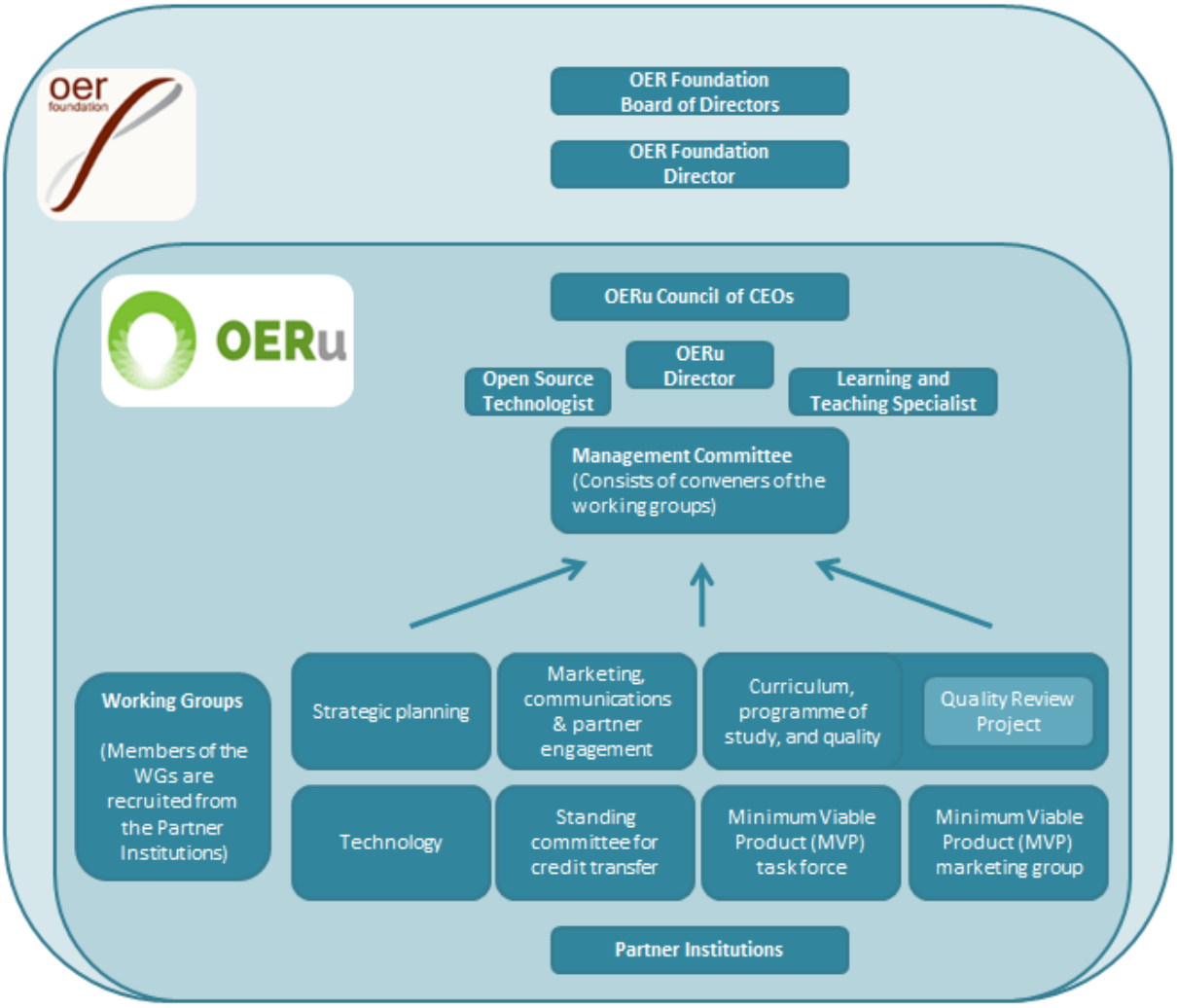

Figure 5.3. Organizational structure of the OERu in 2019

The OERF's organizational structure was strongly influenced by open source software organizations such as Apache Software Foundation and Mozilla Foundation (Mackintosh, 2017). The OER Foundation was an independent non-profit company founded in early 2009, "that provides leadership, international networking and support for educational institutions to achieve their strategic objectives using open education approaches" (Mackintosh, 2017, p. 103). This stance was reflected in the name of the organizations: Open Education Resource Foundation and Open Education Resource universitas. The OERu CEO explained the meaning of the portion of the name that is "Open Education Resource":

> We are not the 'Open Educational Resources' Foundation. For us, 'open education' is an umbrella concept encompassing multiple dimensions of openness including Open

> Educational Resources (OER), Open Educational Practices (OEP), Open licensing, open policy, free and open source software (FOSS), and open philanthropy. Resource (singular) is used as a noun to infer that openness is the primary means and enabler to achieve more sustainable education futures for all. Openness is the DNA of the OERF – we do not do closed as a matter of policy (Mackintosh, 2017, p. 102).

In short, the name reflected the culture of the OERF and the OERu. This quote captures the essence of this chapter and illustrates the mindset that informs how the OERu was managed and how it implemented OEP.

The OER Foundation's Board of Directors governed the OERu and guided the Director of the OER Foundation, who was also the OERu CEO (UNESCO Chair, n.d.; OER Foundation, 2016). The OERu Council of CEOs was "an assembly of senior leaders called together for consultation on strategic tertiary education futures and open education approaches" (OERu, 2015e). Their role was "to provide executive leadership at the corporate institutional level to facilitate the achievement of the aims of the OERu for the mutual benefit of learners and its members" (OERu, 2015e). Wayne_AD described the organizational structure:

> I'm the executive director and I report to an international board of directors. I am also a member of the board of directors of the foundation, so that's where all the administrative decisions for the OERu are taken. We have an advisory Council of CEOs which are the designated VCs of these institutions.

The only employees of the OERu were its Director and an open source technologist (OST) until late 2018 when two Learning and teaching specialists were hired. The number of employees was low because the OERu network was designed so that a large portion of the course development work would be accomplished through volunteer work distributed among the Partner Institutions (Wayne_AD). Thus, the OERu was intended to include a large number of institutions and to provide an open invitation to more institutions to join. The very structure of the OERu was thus a manifestation of open educational practices. The OERu CEO represented the OERu nationally and internationally, planned meetings for the OERu, consulted members for feedback on meeting agendas, worked with the OERu's OST to maintain the online infrastructure, and attended Working

Group meetings among other tasks. Thus, the OERu CEO acted as a bridge between the OERu and any institution it worked with. He also acted as a bridge builder by enabling organizations to work together.

The OST had a variety of tasks related to building and maintaining the OERu's internet-based infrastructure. He verified email and chat channels for urgent requests for support. He updated servers distributed globally that supported the OERu's digital learning environment. He conducted research on new technologies and developed software. He helped to develop the OERu's use of Mautic, a marketing automation platform to send emails to OERu learners. These emails were sent on a schedule to inform learners about actions to take in preparation for a course, due dates for assessments, how to get assessed, etc. Examples of these emails will be discussed in Chapter 6. The open source technologist also improved hosting services. In his words,

> I recently changed the way we host our main WordPress "multisite", https://course.oeru.org, so that it's built as a collection of Docker containers, and I was able to improve the number of simultaneous learners we could support by 10 times without increasing our costs...

This quote is intended to illustrate how the OERu worked with open source technology to build a sustainable global infrastructure for students located anywhere.

The OST wrote blog posts about using open source technologies (OERu_Technology, 2018a). He was responsible for protecting learners' data from being lost and for making aspects of technology easier to understand for others. He explained his role this way:

> Well, ultimately, as a software developer, you're a people interpreter: you're someone who learns what others want to do, how they want to do it, and then you work out how to "codify" that in software. … good software developers are keen observers of human behavior.

Hence, his role in open philanthropy was to solve technical issues to improve the learning experience and improve Mautic and WordPress. He also explained how technology worked in layman's terms (OERu_Technology, 2018b) to reduce disruption caused by the introduction of

these technologies. In short, the use of open source technology, the sharing of information about how it was modified, and the use of an accessible communication style were all OEPs implemented by the OERu. The development of open source infrastructure represented the technological evolution of the OERu's ecosystem.

Some technologies that the OST developed based on existing code are included in Figure 5.4. Many of these applications are discussed in Chapter 6 because they are more relevant to OERu courses for supporting learning. Together, these technologies formed a *Next Generation Digital Learning Environment* (NGDLE) intended to support learning openly on the internet as opposed to working within the confines of a LMS. The open source technologist indicated during the International Partners meeting of 2018 that Partner Institutions had the potential to evolve technologically by adopting such open source tools to make significant savings and minimize risks.

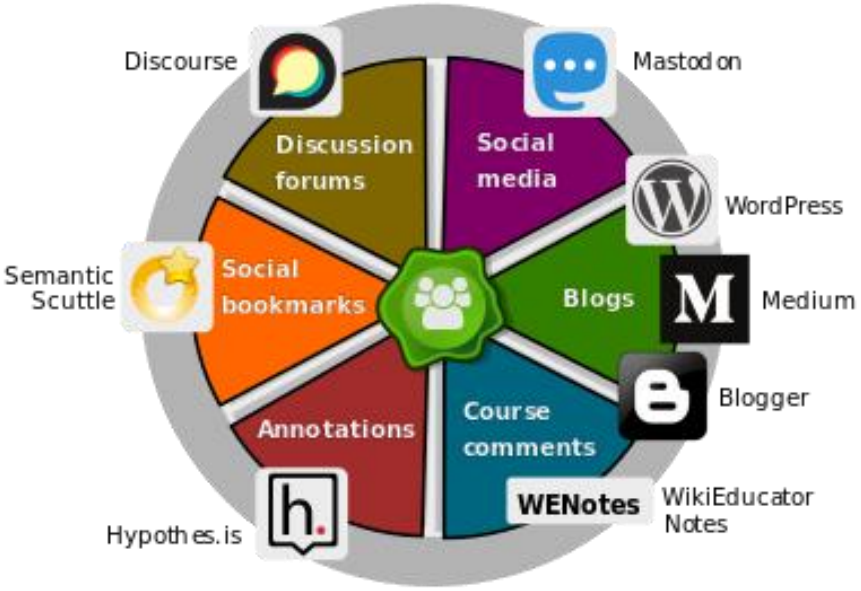

Figure 5.4. OERu technologies in the OERu's NGDLE (OERu, 2018g). Screen capture taken November 8th, 2019

During the same meeting, the OST explained that the total annual budget for software and infrastructure at the OERu was $4800 USD. This point is relevant in showing that the OERu's focus on open source technology led to a measurable cost savings and proven sustainability. He went on to

suggest approaches to take regarding technology for the launch of the Minimum Viable Product (MVP). The MVP is a concept used by software start-up companies to refer to the product that a company can create with the minimum amount of effort to obtain the maximum amount of feedback to improve the product's features (Lenarduzzi & Taibi, 2016). The OERu's "product" was its two exit qualifications.

The OERu CEO and OST envisioned further technological innovations for after the MVP's completion. The OERu CEO hoped to develop a course on accessibility for various tools including mobile and desktop devices, providing professional development for technical staff at PIs using OERu applications, improving the design of the OERu page that displayed course descriptions, and implementing tools to monitor activity related to the OERF systems to increase their scalability. The OST announced additional plans such as launching a new open messaging system to reach the OERu community, finding an application for inserting questions and answers written by students in OERu courses, and finding automated assessment platforms (OERu, 2018f). In short, the OERu's plans beyond the delivery of the MVP were to continue its technological evolution.

The OERu CEO and the OST focused extensively on open source technology, and the OERu organizational ecosystem was strongly influenced by this culture (Wayne_AD). The OERu's focus on open source technology in parallel with its Partner Institutions' focus on education (within the context of this research) is a duality that will recur throughout the findings of this study. This duality fundamentally influenced how the OERu and its PIs interacted and influenced the evolution of technology and education, respectively.

It was suggested at the 2018 International Partners meeting that the number of OERu employees should increase from two. One recommendation was to advance course development work by accepting secondments of personnel from OERu Partner Institutions (OERu, 2018f). Consequently, in

late 2018, the OERu hired two Learning and Teaching Specialists on a part-time basis. They shared the roles of reviewing micro-courses for the Certificate of Tertiary education in Business, developing tests and other assessments as well as rubrics for micro-courses, as indicated in a follow-up to an interview with Wayne_AD. This information was supported by a media announcement (OERu, 2018t), and it highlighted the OERu's PIs' interest in seeing courses being developed. The media release was a public announcement of the OERu's slight shift towards dedicating resources to course development. This point highlights the PIs' interest in education and course development, and the educational evolution of the OERu. This interest in education complemented the OERu CEO's and OST's interest in developing technology which had driven the OERu's evolution until then.

This description of the organizational structure continues with an explanation of the PIs' role, beginning with an explanation of the process of joining the OERu network. Wayne_AD explained that the OERu formed partnerships on the basis that prospective partners agreed to contribute a fee and develop and share two openly licensed courses with the OERu. They also agreed to principles of engagement and to make decisions collectively and openly through the network. There were no contracts or MOUs. He explained that this was a collegial approach and that the OERu was a charitable organization. If an institution chose to end the partnership earlier than planned, it faced no repercussions. The intention of having the PIs develop two courses was to distribute work among the partners while building a collection for the OERu to offer to learners. The OERu did not directly offer credit (apart from the badges as micro-credentials for micro courses). PIs could take on additional roles such as assessment, giving credit for a course, or recognizing a course accredited by another partner of the OERu through articulation as members of a global ecosystem community. This task distribution illustrates the OERu's disaggregated model of providing accredited courses and is an operationalization of the mission.

Partner institutions were involved in the OERu's work in another way: their employees could take on volunteer roles in the OERu's working groups. The nature of the working groups was described by Wayne_AD:

> Within the OERu itself, in terms of our administrative organization, we have a working group structure. Each of the working groups have convenors. The notion of working groups is that they're not permanent structures. They have a particular task and once that task is completed, the working group could dissolve. The only permanent working group is the standing committee for credit transfer. Given the decisions taken at the recent partners' meeting, we're going to do a bit of rationalization around some of these working groups. It appears to me that we're going to be working towards a trans-national advisory group which will have three standing committees: credit transfer and course articulation, quality, curriculum and program of study. This would make up one working group. You would have seen that we also have a Management Committee, which is made up of the convenors of the working groups. We have open meetings. In 2016 we reduced the number of meetings of the Management Committee because of the focus on MVP. We established a MVP task force which was clearly focused on getting MVP done. Once MVP is done, we will dissolve that working group.

This quote is significant in indicating that the Working Groups, as a large part of the OERu's organizational structure, had a specialized and temporary role. These characteristics are consistent with an Adhocracy.

The Management Committee mentioned in the quote above was convened by the OERu CEO. Staff from partner Institutions formed the working groups, which meant that there was bridging among the ecosystems of the OERu and the participating PIs. The working groups were named as follows:

- Strategic planning working group
- Marketing, communications & partner engagement
- Curriculum, programme of study and quality (which has a currently active sub-group called the Quality Review Project)
- Technology working group
- Standing committee for credit transfer
- Minimum Viable Product (MVP) task force
- MVP marketing group (OERu, 2016t).

The plans to reduce the number of working groups to three (Curriculum and Quality, Technology, and Marketing and Recruitment) were mentioned in the quote above and in the minutes of the OERu's 2017 International Partners meeting of 2017 (OERu, 2017e). These plans represented a self-organization process of ecosystems merging into a more complex one. Further points discussed at

International Partners meetings will be examined; they illustrate how the OERu interacted with its PIs. These meetings tended to be used as opportunities to discuss the OERu's strategic planning.

At the 2018 International Partners meeting, there were increased efforts suggested to improve the OERu's operations. One suggestion was to assemble an OERu task force to survey partners to identify good practices and barriers to OER engagement, define clearly the benefits of joining the OERu, find evidence of a return on investment (ROI) for involvement with the OERu, and support PIs in increasing their ROI. Other suggestions were to develop new training resources for partners to understand the fundamentals of the OERu's operations, develop guidelines for partners institutions to show support for open education, and identify barriers inhibiting potential partners from joining the OERu. An additional suggestions was to develop an initiative to allow institutions from low- and lower-middle-income countries to join the OERu, even if they were not able to pay membership fees (OERu, 2018g). The interest in professional development was an indicator of the Clan, through its internal focus of supporting members. The OERu also indicated the intention to review one of its Strategic Plan goals to include methods for driving value for member institutions with the intention of achieving "a fiscally sustainable and scalable OERu network" (OERu, 2018g). Some examples related to increasing value were: "teaching on a global platform… social good, improving efficiencies, cost reductions, opportunities for new business, changing teaching practices, etc." (OERu, 2018g). Attendees of the 2018 meeting also recommended that the OERu promote open source technologies in a way that non-technology experts could appreciate their value. They also recommended increasing the OERu's labor force through secondments and financial support from PIs to increase the rate of course production (OERu, 2018f). These efforts can be interpreted as attempts at not only achieving fiscal benefits, but also increasing alignment between the OERu and its PIs. The aim appears to have been an increased educational evolution by the OERu, as well as adoption of open source technology by PIs while doing social good.

To elaborate on the point above about the OERu's initiative aimed at increasing diversity among its global membership, the OERu was aware that it lacked balance in terms of representation from all continents. It intended to remedy this situation by recruiting members from more locations, as reported in the minutes of the International Partners meeting and the OERu Council of CEOs meeting, both held in October 2016 (OERu, 2016o, 2016p). This intention was further supported by stating an OERu value of "Strength through diversity" (OERu, 2016a). The issue of improving partner recruitment was further discussed at both the International Partners Meeting and the Council of CEOs of 2018. To this end, the Council of CEOs decided to simplify and shorten the letter normally used by the OERu to invite institutions to join the network (OERu, 2018g). It also decided that the OERu should improve the portion of its website dedicated to providing information about the benefits of participating in the OERu network (OERu, 2018g).

The OERu membership slowly diversified and increased from eleven founding partners (ten academic and one non-academic) in 2011 (OERu, 2014a) to the 28 members mentioned above in 2016. The OERu has continued to grow since then. There was a challenge in managing the complexity of uniting ecosystems with diverse interests. Notwithstanding this challenge, at the International Partners meeting of 2018, there was greater diversity than in previous years, particularly among those participating at a distance.

5.3. The OERu represented through the Arena framework

An examination of the OERu using the Arena framework aims to explore how the matter within interacted and influenced the evolution of technology and education across the system. The matter pertaining to the OERu is mapped on an Arena diagram in Figure 5.5. centered on course development. In Figure 5.5., the large blue shape with the solid outline represents the ecosystem containing matter involved in the design and development of LiDA and the delivery of one of its constituent micro-courses: LiDA103. The dark blue oval shape with a dashed line represents the

ecosystem community involved in planning the OERu's work. The purple dotted L-shape represents the ecosystem community that formed between the OERu, Otago Polytechnic and the New Zealand Government to produce the Edubits Badge program (described elsewhere). The purple double-lined shape represents the ecosystem formed by the OERu CEO and UNESCO as he was the UNESCO-COL-ICDE OER Chair during my research period, and UNESCO was a sponsor of the OERu.

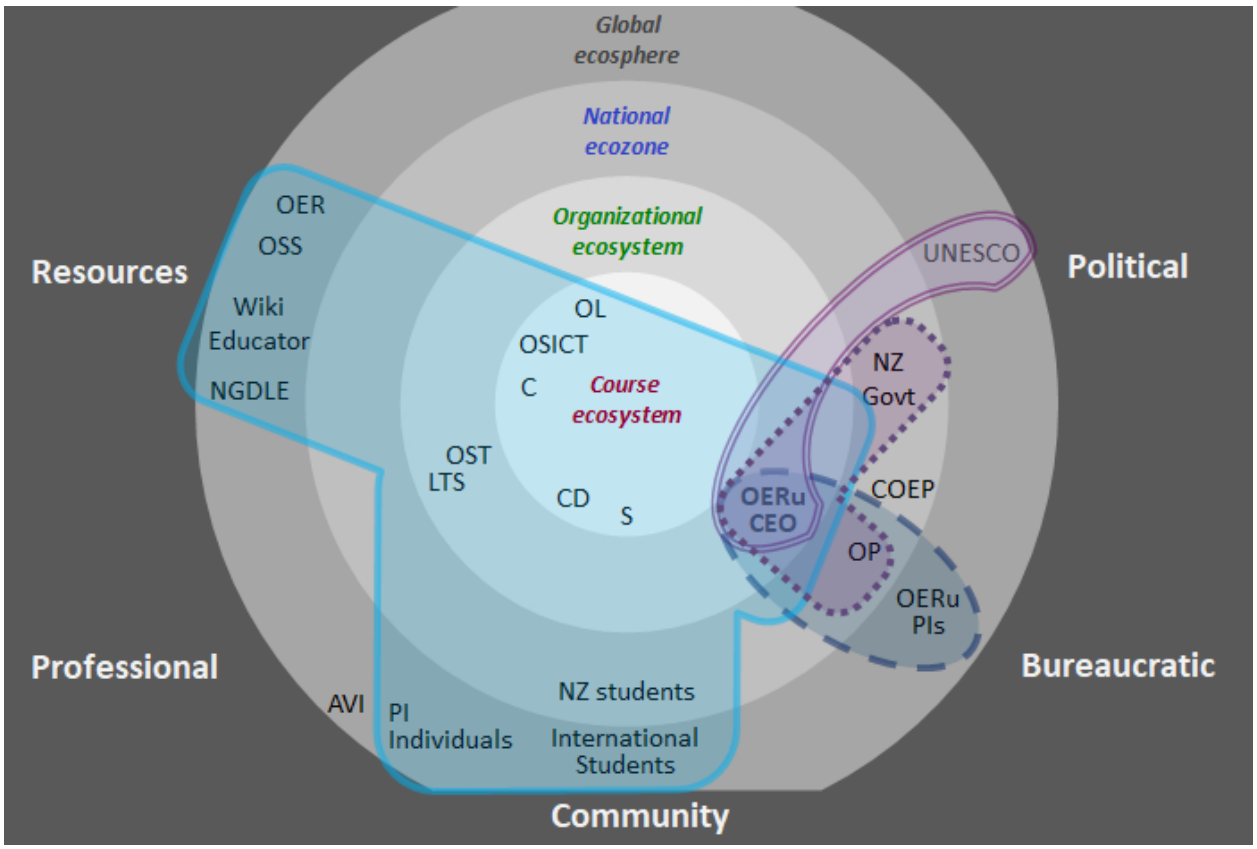

Figure 5.5. Arena centered on the OERu's design, development, and delivery of the LiDA course.

KEY (Matter is presented in clockwise order for each circle.)

Course ecosystem

S stands for students who are participating in a course for credit or not.
CD stands for course developer.
C is the course.
OSICT stands for open source information and communication technologies.
OL stands for open licenses.

Organizational ecosystem

OERu CEO is the keystone species of the OERu.
LTS stand for Learning and Teaching Specialist.
OST is the open source technologist.

National ecozone

NZ Govt is the New Zealand government

COEP stands for Centre for Open Education Practice
OP is Otago Polytechnic
NZ students are students from New Zealand not participating in a course

Global ecosphere

UNESCO is the United Nations Educational, Scientific and Cultural Organization
OERu PI stands for Partner institution involved in the OERu's administrative activities.
PI individuals stands for staff members of PIs involved in the OERu's activities as volunteers
International students are those who are not participating in a course
AVI concept. AVI stands for Academic Volunteers International
NGDLE stands for Next Generation Digital Learning Environment.
OER are Open Educational Resources.

Within any ecosystem the keystone species is a key influence (Davis, 2018). With the OERu as a small employer and actively involved CEO, the keystone species (indicated in bold in the organizational ecosystem in Figure 5.5.) had a strong influence on the organizational cultures. This influence on culture was largely manifested by modelling the OERu after the open source community by adopting processes such as those described by Raymond (1999). The OERu CEO perceived that the global OER movement had an imbalance between the input and output of energy as OER production exceeded OER adoption. He wanted to correct that imbalance by promoting a culture of sharing and reducing energy expenditure on producing redundant copies of copyrighted materials (Wayne_AD). Ultimately, it was the students who were to benefit from these efforts. To achieve its goal, the OERu required energy through financial support. The OERu received funds from donors and Partner Institutions to support its operations. One example of a donor was Otago Polytechnic, which is located in the bureaucratic sector in Figure 5.5. The funds supported the OERu's activities such as holding online and face-to-face meetings. These meetings, as examples of -open communication, helped to bridge ecosystems across the network to facilitate the flow of energy in the form of knowledge and resources. This flow of energy was also supported by the OERu's practice of open philanthropy.

Another OERu activity was the open source technologist's (OST) work on evolving the open source infrastructure. OST is found in Figure 5.5. between the Resources and Professional sectors. His

professional skills focused on the OERu's digital resources, including maintenance of WikiEducator and the development of the NGDLE based on open source software found online and adapted to the OERu's needs. This infrastructure had the potential to influence how the students interacted and learned by using a NGDLE. Thus, open source technology and OER stimulated each other's development in a process of co-evolution.

The PI individuals stimulated the OERu's educational evolution towards increased production of OER by, for example, requesting that Learning and Teaching Specialists be hired. This request was realized soon afterwards. This educational evolution occurred in parallel with the OERu's overall technological evolution. Thus, the OERu and the PIs had a symbiotic relationship in terms of their respective interests in technology and pedagogy. To the extent that the OERu and its PIs were benefitting from each other's work, there was mutualism. Since student interaction occurred openly online, institutions both in and outside of the OERu network could observe this co-evolution and be stimulated to innovate in ways that suited them and their respective ecosystems. Evolution processes could be stimulated by encountering stressors resulting in positive or negative impacts. In those situations, keystone species could help to make the most of the positive impacts and reduce the severity of the negative ones.

The AVI concept was an initiative that was not realized during my research period. It was to consist of professionals who would support OERu students. This point is described in more detail in the Capacity category in the stressors section, at the end of this chapter. AVI is located approximately halfway between the professional and community sectors because, to be effective, it required that the participants be professionals skilled in online educational technology or knowledgeable in a subject area. Plus, the role was volunteer-based, explaining its link to the community sector.

The OERu was involved in a national pilot project for providing badges as micro-credentials for micro-assessments (assessments given upon completion of micro-courses) in a program called Edubits (New_Zealand_Government, 2017). Edubits was an initiative of Otago Polytechnic for offering assessment services and micro-credentials for OERu courses. The New Zealand Qualifications Authority approved Edubits as a form of formal credit offered by Otago Polytechnic (OERu, 2017e). Through this official form of accreditation in combination with the OERu's programs for transferring credit across Partner Institutions, students would be enabled to obtain recognised tertiary education micro-credentials.

5.4. The OERu's ideology

The OERu's ideology consisted of its principles of engagement, aims, vision, mission, and proposed values for partners. These items informed how the OERu functioned, and thus, its organizational cultures. The OERu described its culture through its principles of engagement by modeling itself after the open source community, which represents an OEP in the context of the current research. The OERu's principles of engagement guided the OERu's actions, as explained by Wayne_AD and were outlined as such:

> Anchor partners of the OERu are serious about getting OER right and crossing the chasm from early adopters of open content to mainstream organizational implementation in the formal education sector. All institutions are free to join us in moving from the notion of *sharing to learn* to *learning to share* and by joining this project agree to the following rules of the game:
>
> - Learning materials for all courses contributing to the qualification credentials will be based entirely on OERs which, to the extent possible, meet the requirements of the Free Cultural Works definition.
> - All new resource developed under the OERu will be licensed under Free Cultural Works approved licenses.
> - Participating organisations subscribe to the values and practices of open philanthropy with reference to all activities of the OERu.
> - Participating teaching institutions will provide assessment services at reduced fees when compared to full course enrolment fees.
> - Participating teaching institutions will offer credentials for OER learning which are aligned with approved programmes and/or national qualification frameworks (OERu, 2015b).

These principles imply a Hierarchy, which signifies an interest in an internal focus and control. Further, these principles are associated with a leader that functions as a coordinator or an organizer (Cameron & Quinn, 2011), which appears to be a relevant characterization of the role of OERu CEO.

Wayne_CD mentioned the desire for a culture shift to "learning to share" meaning that he would have liked for the culture of tertiary education to be more accepting of using OERs produced by others as well as creation and sharing of OERs. The desire for a culture of sharing differed from the current culture where people tended to only create and share OER; instructors tended to be averse to borrowing OER(Wayne_CD & Rory). The practice that Wayne and Rory advanced was to use OERs that existed and to modify them as necessary, as opposed to creating OER from scratch, when possible. A culture of sharing is compatible with the Clan and is consistent with an internal orientation and integration (Cameron & Quinn, 2011).

In line with the culture of sharing was the agile culture of releasing technological products (courses, planning documents, etc.) early (as opposed to being fully finished) and with updates. To this end, the OERu adopted an organizational structure that was independent and worked outside of traditional universities, in its own ecosystem. As explained by Wayne_AD,

> Existing models and processes for doing thin gs within the organization do not migrate well to the open environment, in terms of how things work at an organizational and institutional level. That, in part, is the reason why the OER Foundation has been so successful. We took a conscious decision to establish the foundation outside as an independent entity. So that we are not encumbered by internal organization decision-making processes. As an independent entity, we have the agility and freedom to move quickly in ways that support attainment within existing policies of our Partner Institutions.

This quote is significant in highlighting the OERu as an independent organization, as it indicates an external focus on tertiary education institutions and the desire to differentiate itself from them.

Given that this desire was materialized through the establishment of an organization, these are strong indicators of an Adhocracy.

The agile process adopted by the OERu was described in "The Cathedral and the Bazaar" (Raymond, 1999), a reference about how open source communities work. It was often cited by the OERu CEO as an inspiration for leading the OERu. The "cathedral" refers to traditional approaches in universities for developing complex plans fully before beginning development work. In contrast, the "bazaar" refers to a practice where a project is partially planned, undergoes development, and is released or published, and undergoes frequent revisions afterwards in an agile process. Revisions are enabled even after the content is published. This frequent release of materials into the global ecosphere was intended to be philanthropic; species in the ecosystem might benefit from them, even if they weren't initially up to the best standards. In addition, the OERu could benefit if users provided feedback on the materials. The dynamic nature of the OERu plus the adaptable practice of releasing a product frequently with modifications are signs of the flexible nature of the Adhocracy. Additionally, the bazaar approach is consistent with the Adhocracy characteristic of focusing on developing products quickly.

Another example of agility that the open source community used was a process described by the OERu CEO as "rough consensus and running code" (OERu, 2016j). This process involves briefly discussing a decision, though not to the point of examining all details, as one would do in the "cathedral" approach mentioned above. Thus, a full consensus is not obtained, but a rough one is. A rough consensus was not fully defined, but it did not require a majority vote (OERu, 2016j). This approach was agile in revealing an acceptance of not publishing work that was necessarily of the highest quality. This approach was risk-oriented, but allowed for moving a project forward and for reversing decisions subsequently as required. Thus, the OERu embraced ambiguity, which was consistent with the Adhocracy. Further, the development of the agenda for the 2016 International

Partners meeting was an excellent example of Adhocracy. Five people besides the OERu CEO either made changes directly to the WikiEducator page of the agenda or had sent feedback to the OERu CEO in an email so that he could make the changes (OERu, 2016r). Subsequently, the agenda was discussed in an online meeting and further modified. It was modified again at the beginning of the very meeting it was used to plan. This flexibility and adaptability to act on different people's feedback over time was indicative of the flexibility and the ability of the OERu CEO to use his discretion. This is consistent with values associated with the Adhocracy. Adaptability is also consistent with a Clan; however, these processes did not have accompanying indications of strong relationships within the organization. This example stood out as one with high participation within the context of the OERu. For most OERu planning documents I examined, the OERu CEO and the open source technologist made most contributions as shown in the editing history of the WikiEducator pages.

In contrast to the agile process and suggested Adhocracy of the OERu, the vignettes of IIIU and EEEU will show in Chapter 7 that adoption of agile processes was not necessary for OER production. Course developers adopted or slightly adapted their institutions' processes and successfully produced OER. Thus, ecosystems in the same system can be misaligned on some points and still achieve similar aims, such as producing OER.

When asked how open planning and open online communication influenced the OERu's activities, John_AD responded that the Discussion page of each WikiEducator page made it easy to ask for help. The OERu CEO and OST could also directly observe the coding and respond to questions. With a proprietary system, it might be necessary to take a screen capture or describe the problem, which were cumbersome approaches (John_AD). John_AD thought that the open platform also facilitated networking and obtaining other's views on a topic, which reduced stress in the system. For example, it was easy to ask the members of a working group whether a given idea was worth pursuing.

John_AD explained that when he proposed an idea on the OERu's open platform, he received feedback on how that idea could be implemented while being tailored to the OERu's approach. He felt strongly supported in proposing his initiative. Similarly, Stephen_AD described the culture of the OERu as one where competition was not felt. Instead, he sensed that there was an alignment of values in terms of offering open education. Interpreted as cohesion, this characteristic is indicative of the Clan's internal focus on unity. During online OERu meetings, the OERu CEO acted as the facilitator and explained that anyone was welcome to provide feedback and to edit the WikiEducator planning pages. This flexibility was indicative of the Clan, whose defining values include flexibility. Adhocracy is characterized by flexibility as well, but in this instance was not accompanied by the required pairing element of an external differentiation. In short, there were indications of a Clan, since the OERu facilitated the participation of its members by providing an online space to communicate, and open communication is a defining characteristic of a Clan. Given that PIs benefitted to some extent from the communication platforms, they facilitated bridge building within the network and the development of mutualistic relationships.

Despite John_AD's positive experience of receiving feedback and Stephen_AD's description of the OERu as a network of people with shared values, there were limits to the sharing and collaboration. John_AD's view was that the OERu's espoused culture of being fully open and promoting sharing was in contrast with its actual culture. John_AD had observed that a core group of people drove the OERu's activities. In other words, work on OERu projects was not distributed or adopted equally across the system. John_AD indicated that increased participation to fulfill the espoused culture of openness and sharing required people to think about their work in a very different way because the culture was based on an ideological choice. The OERu's culture and ideology were shaped by what the OERu referred to as its "network aims", its vision, and its mission. These points will be explored next.

Just as the principles of engagement formed the basis for how the OERu worked with its partners, the aims guided the network projects. The OERu presented its aims in these words:

> Directed by the core principles of engagement the OERu network aims to:
> - Provide free learning opportunities and affordable assessment pathways to enable students to earn credible qualifications from accredited institutions
> - Offer open online courses and programs based on OER and open access materials
> - Implement scalable technology-enhanced pedagogies
> - Implement scalable systems of technology-mediated student support
> - Offer assessment and credentialing services
> - Assure appropriate course articulation among Partner Institutions (OERu, 2015e, 2017j).

As these aims derive from the principles of engagement, they are more specific and lend themselves to action. They also emphasize the Hierarchy characteristic of the OERu.

The OERu's aims were guided by its vision, mission, and organizational values. Its vision was the following: "We envision a world where all learners have affordable access to tertiary education". To have an emphasis on a vision for the future is consistent with the Adhocracy. The mission was: "Members of the OERu network demonstrate their public service missions through the provision of alternate pathways to credible credentials using open education approaches" (OERu, 2016a). The mission was intended to be realized through the disaggregated model of course assessment, accreditation, and credit transfer across the network. The mission can be seen as an expression of the intention to orient the PIs' evolution towards increased openness as well as a way of delegating course development and accreditation work to them. Another statement on the same page as the vision and mission offered insight into the organization: **"**OERu is a low cost, low risk – but high impact collaboration. Partnership with the OERu brings substantial ROI to leading institutions around the world- social good, global recognition, and increased revenues" (OERu, 2016a). This point indicates the OERu's interest in developing mutualistic relationships with and among its PIs. To elaborate, the OERu intended to offer education that complemented that which was provided by formal academic institutions,

> especially for those who lack the means to follow traditional learning paths So for example, sharing course materials funded for mainstream delivery under an open license does not add additional cost for this institution if these are shared with the communities our public funded institutions are established to serve. On the contrary, this enables the organisation to serve a wider community without increasing cost (Mackintosh, 2017, p. 107).

Given the OERu's interest developing cohesion and integration among its partners with a shared vision of providing affordable education, the evidence suggests that it was a Clan.

5.5. Manifestations of the OERu's organizational cultures through OEPs

In this section, I describe the OERu's OEP of applying open philanthropy and define this term. I also describe the OERu's OEP of open communication which involved websites, open source tools, online meetings, and meetings using blended face-to-face and elaborate online communications. These findings are intended to illustrate patterns of behavior as manifestations of the organizational culture of openness along with a strong reliance on open source technology.

Open philanthropy

The OERu's application of open philanthropy involved sharing documents for the potential benefit of anyone in the global ecosphere who had internet access, thus saving time and effort in developing documentation. Interested parties could use documents produced by the OERu and make adaptations as needed. The openness was about sharing materials with CC licenses as Free Cultural Works on open platforms. Mackintosh illustrated this application of open philanthropy:

> We encourage that funding proposals are developed transparently and endorsements or participation from the OERF in philanthropic partnerships prefers that these documents are openly licensed. While some competing for contestable funding in open education are uncomfortable sharing proposals under open licenses, we at the OERF believe that if anyone 'steals' our ideas and can do what we propose quicker, cheaper or of better quality – then they deserve the funding. When outputs are released openly, as in the case of OER, we all benefit and the ecosystem grows (Mackintosh, 2017, p. 105).

The OERu's approach to open philanthropy was informed by the Shuttleworth Foundation's theory of change (Change, 2018) whose application was explained by Mark Surman (2008). Surman was the Executive Director at Mozilla and the lead author of the Cape Town Open Education Declaration (Surman, 2008a). Surman's (2008) approach was based on the following ideas:

- All works produced by the organization are to be publicly accessible using an open license and open source software.
- A cycle of sharing and receiving materials which are leveraged to increase offerings to be shared.
- Working as a community and forming partnerships.
- Radical transparency with regards to planning documents so that the public can be informed, and consequently suggest ideas and perhaps develop initiatives.
- Be open to suggestions from stakeholders and learn from them to guide the organisation's actions
- Not all ideas can be implemented, and some can go viral
- Good ideas need to be nurtured and realised with adequate planning for sustainability (Surman, 2008b).

A simpler explanation of open philanthropy as the OERu practiced it regularly was to conduct its planning "openly and transparently" (Wayne_AD) so that its Partner Institutions could keep current with its progress and provide feedback. John_AD explained that having access to planning documents was helpful to support decisions regarding courses. John_AD provided an example where his university would hypothetically offer an open boundary course developed according to the OERu's quality standards. In this case, a national body responsible for quality in tertiary education would evaluate this course. It would also want to see the documentation explaining the quality standards used for its development before approving the adoption of the course. Thus, providing materials to support innovation is an indication of an Adhocracy. The points in the list above about radical transparency, community, sharing, and receiving were nurtured at the OERu. They suggest aspects of a Clan in the culture whereby open philanthropy has the potential to nurture relationships among organizations such as the OERu and its Partner Institutions.

As another example of open philanthropy, the OERu CEO recorded many of the meetings that the OERu held online and face-to-face and placed the recordings online in WikiEducator. WikiEducator was also used to store planning documents which were openly licensed and to produce OER. The OERu also used public online discussion forums. These forums were intended for all communication about OERu projects; communication that occurred in private was not recognized (OERu, 2016j). John_AD had used these forums and suggested an improvement. He thought that the discussions

could be tagged so that their content could be filtered according to search words and lead to fewer and more pertinent results. The discussions in the OERu Community forums can be tagged, so John_AD's suggestion indicates an interest in a modified system of tagging. The OERu's application of Surman's notions of publicly sharing and openly licensing its planning documents and communications highlights its openness and versatility. It also reveals an attempt to build bridges across the network. Together, these indications suggest that the Clan was valued.

Yet another example of open philanthropy involved the suggestion by a breakout group at the 2018 International Partners meeting to map OERu courses against the Sustainable Development Goals. According to the rapporteur of this group, a subsequent step would have been to develop a program for a first year of study on sustainability. The group had noted that there would not necessarily be sufficient demand for such courses. Thus, it proposed that the OERu proceed with developing courses on sustainability while taking market demand into account (OERu, 2018f). This point was endorsed as one of five OERu innovation pilots by the Council of CEOs (OERu, 2018g). This example provides an indication of the Market, since it was externally focused.

Open communication

Having explored the OERu's OEP of open philanthropy, we turn to a particular aspect of this approach that was broadly used by the organization: open communication. The OERu had many strategies for open communication and used a variety of web sites and online tools for supporting communication with its partners, prospective students, and the public. The most common types of communication platform on the site were the "Discussion" pages (known as "Talk pages" by the OERu) associated with each WikiEducator page (see Figure 5.6.) (OERu, 2015k).

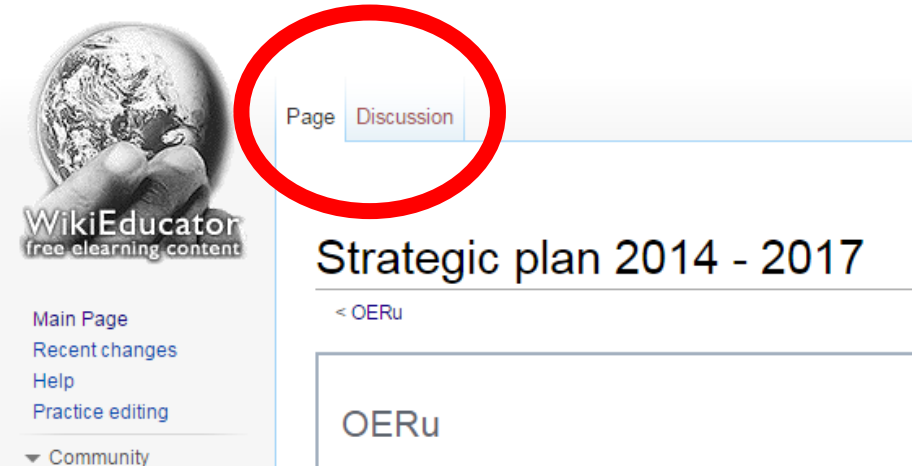

Figure 5.6. A portion of a WikiEducator page. A red circle indicate the Page and Discussion tabs page (OERu, 2015k). Screen capture taken on May 10th, 2016

Other communication sites included the *Google Groups OERu* page for announcements from the OERu CEO and posts from anyone on any topic related to the OERu (OERu, 2018j). Another site was *OERu Chat*, an open chat engine used by the OERu where there were many "channels" available for discussing specific topics in real time (OERu, 2018i). A commonly used channel was oer-course-dev for chatting about details related to course design or coding in the WikiEducator platform (OERu, 2018d). A site that was formerly used for discussion forums was *Groups OERu,* where there was a forum for each Working Group of the OERu and for other topics (OERu, 2018a). During my data collection period and ever since, the *OERu Community* was the main discussion site for the OERu and its members (OERu, 2019a). The OERu had several social media pages including a Facebook page (OERu, 2018p), two Twitter pages (Mackintosh, 2019; OERu, 2018p), and a main YouTube channel (OERu, 2018e). Two additional YouTube channels contained videos created for the OERu (Mackintosh, 2016b; OERu, 2018s). It also had a WENotes page (OERu, 2019b), which was an aggregated feed of microblogs containing the hashtag #OERu**.** A similar feed was used in OERu courses. It displayed posts that contained a hashtag corresponding to the course in question. Additional communication methods were available (OERu, 2015d). This dedication to fostering communication to increase participation and collaboration within the OERu network is an indication

of a Clan, given its internal focus. It was also an approach that nurtured the PIs' evolution towards openness and the adoption of open source technologies.

Communication on OERu platforms was not only spurred by the OERu CEO. Occasionally, other individuals in the OERu network started discussions there. For example, John_CD used the "Talk pages" in WikiEducator to reach out to the OERu community regarding projects for both course development and OERu working groups. He found these pages to be helpful in obtaining fast and relevant responses. Stephen_CD and Samantha similarly used the WikiEducator pages to obtain feedback on the course they had developed for the OERu, and four or five people responded. Stephen_CD and Samantha found the feedback to be useful as it helped them to improve the quality of their course, though they had hoped to get more responses. This kind of communication facilitated mutualism and further demonstrated the Clan.

I will now provide two examples combining open communication and open philanthropy that offer indications about the OERu's organizational cultures. The first example explores how the OERu ran a portion of a face-to-face meeting to include on-site and online participants. Most other sessions at this meeting were run in a similar fashion, and this one was selected as it is representative of them. For context, the OERu annually held its International Partners meeting over two days followed by the one-day Council of CEOs meeting. These meetings were held in face-to-face settings and changed location from one continent to another annually. They provided an opportunity for the OERu to consult its members regarding strategic planning. People also attended from a distance by connecting through live streaming, wiki pages, and links in the OERu's online agenda. For example, at the International Partners meeting on October 3rd and 4th, 2016 in Inverness, Scotland, online participation was welcomed and facilitated through links on the Meeting Agenda pages (OERu, 2016ah). See Figure 5.7. for an illustration of the links (in green) provided to facilitate participation in

the portion of the Oct 3rd agenda at 12:00 pm - 12:30 pm entitled *Critical friend review, priorities and issues*.

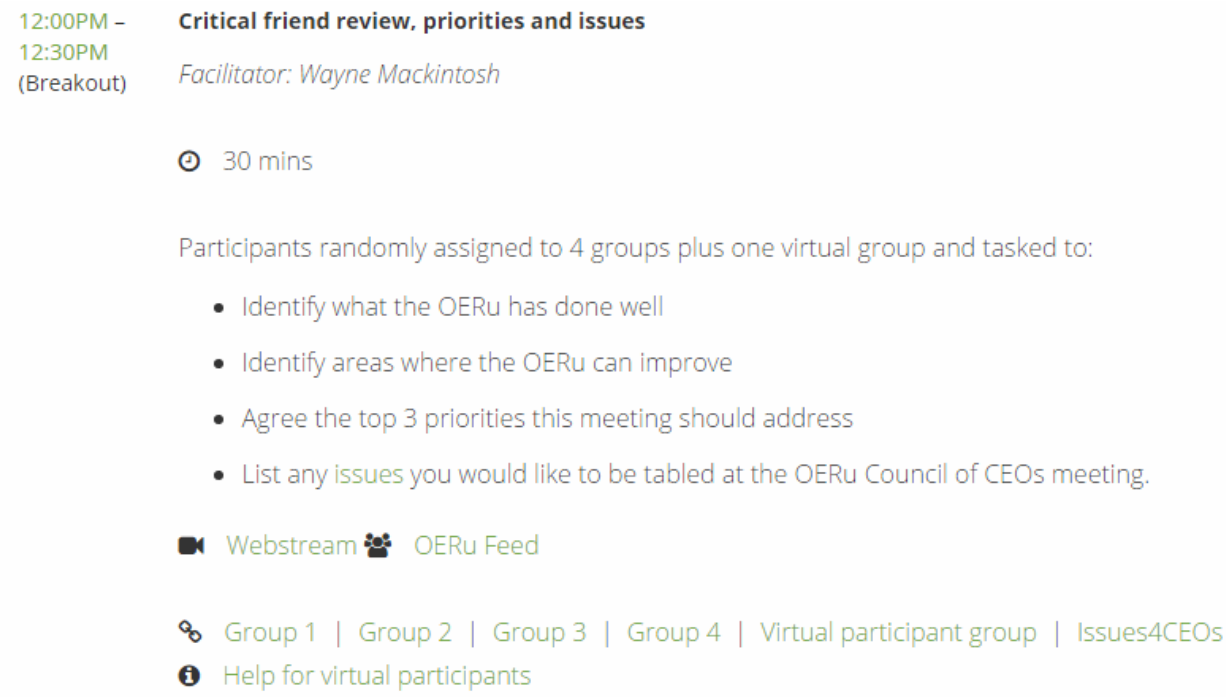

Figure 5.7. Portion of the agenda of the first day of the OERu International Partners meeting in Inverness, Scotland, Oct 3rd – 4th, 2016. Screen capture taken on Feb 19th, 2016. (OERu, 2016ah).

Participants were able to access the meeting's social media feed by clicking on "OERu Feed". During that session, all participants - both on-site and online - were split into groups to discuss points such as the OERu's strengths and weaknesses. All instructions and passwords necessary for participating virtually in the meeting were provided in the "Help for virtual participants" link. During this session, each group took notes on worksheets in WikiEducator. Clicking on the "Virtual participant group" link led to a password-protected etherpad (collaborative web page) to be filled by the virtual participants. After completing the worksheets, all groups re-assembled physically or online (via the Webstream link) in the main meeting room in Inverness. One representative from each group reported a summary of their respective worksheet contents. There was a face-to-face rapporteur assigned in advance to each online group so that these groups could be represented in the plenary sessions. Online participants could attend sessions synchronously and fill out the etherpads at any time (OERu, 2016q), though it was most useful to fill them during their respective sessions.

The second example combining open philanthropy and open communication describes the sequence of events that the OERu used to solicit and manage comments leading up to the International Partners meeting and Council of CEOs of 2016. This example was selected because its events occurred over several months using a variety of communication methods. Additionally, it shows the lengths to which the OERu CEO went to for consulting members when preparing for a meeting about the OERu's strategic planning. The events consisted of blog posts and meetings presented in a timeline in Appendix 6.

On August 25th, 2016, the OERu CEO posted an invitation in Forums.oeru.org blogs for the public to participate in the 2016 International Partners meeting (See Appendix 6: Events 1, 2, and 3, which are identical posts made in three groups.oeru forums). The posts also contained invitations to add to the agenda (link provided) of an online meeting to plan the International Partners meeting and to take a doodle poll to schedule the online meeting. No one responded to these messages in the forums. I could find no similar announcements in the Community or Chat pages. Approximately two weeks later, Event 4 occurred, which was the online meeting on September 7th 2016 to plan the agenda of the 2016 International Partners meeting. Eight people attended besides the host: the OERu CEO. The WikiEducator page containing the agenda was edited mostly by the OERu CEO. Four other attendees of the online meeting edited it too. This level of participation in editing an agenda was exceptionally high in the context of the OERu and was never attained again. Most often, it was the OERu CEO who made changes to the agenda. No one posted in its "Talk page".

Event 5 was the face-to-face fifth International Partners meeting on October 3rd and 4th, 2016 at the University of the Highlands and Islands, Inverness, Scotland. During this meeting, there were sessions where the plenary split into smaller groups and then reported back in a plenary session. One of those sessions was explored in the example above. The purposes were to discuss the OERu's

strengths and weaknesses (Event 5.1) and to discuss improvements to its operations (Event 5.2). Throughout October 3rd and 4th, attendees could click on a link labeled "Issues4CEOs" found in many sections of the agenda (see the link in green font in Figure 5.7.). The link led to a WikiEducator page, where anyone could add topics to a rough draft of a list of issues to be discussed during the Council of CEOs meeting (OERu, 2016z). On the day of the CEOs' meeting (Event 7), most of these points were discussed, though not entirely in the planned order, according to the meeting report. Some points were excluded or integrated with others (OERu, 2016o). There was no video recording of this meeting. Approximately six weeks later, the OERu CEO held an online meeting (Event 8) with people from universities in Australia and New Zealand to plan the agenda for a regional meeting. An agenda and a report were produced. It is not clear how the attendees were informed that this online meeting would occur; I found no messages in public forums about it. Less than two weeks later, on November 24th 2016, participants from Australia and New Zealand, plus one Canadian, attended a one-day OERu regional meeting at Charles Sturt University (Event 9). An agenda was produced, but not a report. For Events 8 and 9, the OERu CEO made the majority of the changes, and one person who was heavily involved in the OERu made edits too. One other person edited the agenda. This was the last of the five regional meetings that occurred since early 2014. It was the last of all OERu meetings (not counting working group meetings) listed on the OERu's Meetings page until the 2017 International partners meeting (OERu, 2018c). This series of events illustrated an aspect of the OERu's organizational cultures: it used open philanthropy and open communication for consultation about planning. It shows that individuals from international Partner Institutions participated in online and face-to-face meetings, but did not strongly participate in online discussion forums and editing of the WikiEducator pages.

By frequently holding public consultations the OERu indicated Clan characteristics. The OERu had a common practice of announcing invitations to the public to contribute points to its meeting agendas. Even though the agenda was discussed and edited in online meetings, it was sometimes further

edited later. At the beginning of the International Partners' meeting, the attendees refined the agenda. Throughout the two-day meeting, they were regularly invited to add points to another agenda which Wayne filtered and rearranged in time for the meeting of the Council of CEOs. Thus the OERu showed the importance that it attributed to its Clan values by collaboratively building the agenda of the International Partners meetings. The flexibility shown in accepting modifications at several stages and the values of participation and a sense of collectivity in combination with an internal focus were demonstrations of Clan characteristics.

5.6. Conclusion

The findings presented in this chapter were intended to provide answers to this question: **What is the typology associated with the organizational cultures of the OERu?** To answer this question, it was important to first examine the organizational structure and the roles and interactions within, along with actions taken. Since the OERu's beginning, its employees had been developing its open source infrastructure and tools promoting student-student interactions. It was successful in maintaining the infrastructure at a low annual cost. At the time of my research, the OERu CEO was focused on producing and launching courses for the MVP. The plans beyond the MVP were to continue developing technologies for various purposes and to increase interactions with technical staff at PIs. These actions were geared to supporting the realization of the OERu's vision of providing an education to students located anywhere; its mission was to be operationalized by distributing tasks such as course production and accreditation among the PIs in a disaggregated system. Thus, the vision and mission set out the role of the OERu as the administrating organization and that of the PIs as those providing accreditation, assessment, course production services, etc.

The 2018 International Partners meeting saw the PIs offering suggestions for clarifying the benefits of partnership with the OERu. They suggested using a survey to learn about barriers and enablers to engagement with OER and open education. There were additional suggestions for increasing alignment and the quality of communication between the OERu and non-technical staff at PIs. The

OST was already doing similar work, so this request would have seen his communication role expanding or changing. At several International Partners meetings, the issue of increasing recruitment and diversity among the PIs was addressed. One result was that by 2018, the International Partners meeting had highly diverse attendees. Therefore, its ecosystem was richer.

With an understanding of the OERu's structure, roles and strategic plans, we now turn to the topic of organizational culture. A key point about the OERu's organizational culture is that it was modelled after that of the open source community and strongly relied on open source technologies. Examples of adopting the open source community's culture included the agile approach of releasing content or products "early and often" as per Raymond (1999) and the approach of "rough consensus and running code" to making decisions. These points are all consistent with an Adhocracy, as is the practice of dissolving the Working Groups once their tasks were completed (Cameron & Quinn, 2011).

The "core principles of engagement" provided indications about organizational cultures at the OERu by underscoring its commitment to offering free or affordable programs, courses, and additional study materials and associated services (assessment, credentials, articulation among PIs) plus the implementation of technology-based pedagogies and student support. They were also an indication of a Hierarchy. The OERu was committed to radical openness through open educational practices such as the production of OER only as Free Cultural Works, application of open philanthropy, and offering assessment services at fees lower than usual enrolment fees. The culture was also informed by an intention to change cultures in tertiary education from *sharing to learn* to *learning to share* (including both distribution of one's resources and adoption of other's resources). The OERu influenced its PIs to share more and to be more receptive to sharing of resources. The OERu also aimed to distribute the work of course development and accreditation among the PIs in a disaggregated fashion. The OERu manifested and promoted this culture by practicing open

philanthropy, which provided indications of both an Adhocracy and a Clan. Open philanthropy is consistent with the culture of learning to share, since the aim is to share materials for others to consult and use. This approach emerged from an open source software organization. Thus, the culture of the open source community and the practice of open philanthropy are aligned. The OERu also modeled openness in the way that it fostered communication through a variety of channels. An examination of a series of open communications over several months revealed not only how the OERu used a variety of tools to facilitate communications. It also showed the OERu's commitment to making decisions that involved the PIs, and it showed the amount of time it accorded to strategic planning. Similarly, a variety of communication methods were prepared so that people could virtually attend and participate in an IP face-to-face meeting. These attempts at gathering comments from individuals were indicative of the Clan.

Given that the OERu's commitment to openness, open philanthropy, and open communication to increase sharing and collaboration, these are indications consistent with a Clan. The OERu CEO's desire for a culture of sharing was an example of the OERu's Clan characteristics. So were the organization's vision and mission, and its practices of open philanthropy and seeking comments from its partners, which supported collaboration within the network. The OERu's measures to include institutions from low- and lower-middle-income countries further exemplified the Clan aiming to share its resources so that more students could gain access to an education. The OERu also demonstrated its Clan characteristics when inviting attendees of meetings to comment on the topic at hand such as the meeting agenda and report and to make edits in WikiEducator.

At the same time as demonstrating attitudes and behaviors in accordance with a Clan, the OERu demonstrated characteristics of an Adhocracy through its adoption of practices borrowed from the open source community. Those processes consisted of the approach of releasing content early and often for frequent revision according to the Raymond (1999) and the way the OERu made decisions

using the process of “rough consensus and running code”. While the OERu demonstrated Clan and Adhocracy characteristics, the two were compatible. To illustrate, the network was able to work collaboratively with shared values and a shared sense of philanthropic purpose. It was welcome to provide comments and feedback. It could also apply Adhocracy-related practices of publishing and revising their work frequently and making decisions based on a rough consensus. The reliance on open source technologies for how the OERu operated generally, for strategic planning and for fostering communication and collaboration, will be shown to be just as strong in the next chapter. It explores resources and processes related to course design, development, and delivery through the lens of the Arena framework (Davis, 2018).

Chapter 6. OERu's open course design, development, and delivery

This chapter presents the findings related to the OERu's processes of open design, development, and delivery and the stressors that influenced how it engaged with OER and OEP. The first question I answered was, "**How is the OERu implementing OEPs, particularly for instructional design, development, and delivery of open education?"** To this end, the findings of section 6.1 address items that I have labeled the foundations of OERu's course design. This section 6.1 examines and showcases concepts, resources, and processes that can be applied by practitioners of open education. Tertiary institutions can draw parallels and contrasts with their own resources and processes to explore how they can engage with OER and OEP.

With this basic understanding of the OERu, the reader is more prepared to explore section 6.2, which pertains to the design, development and delivery of an OER called LiDA. The purpose is to show what it meant for the OERu to apply open educational practices; the findings represent an open version of course design and development. This description can provide examples of methods and tools to test for those interested in implementing open educational practices.

Stressors that influence the effectiveness of these processes are also presented, and they can further inform decisions to adopt the OERu's practices. These findings will be analyzed using Davis' (2018) Arena to examine the impacts of different practices across the OERu's ecosystem. In particular, it will examine how the practices affect the sustainability and evolution or co-evolution of education and technology. The stressors are organized according to Cox and Trotter's (2017b) OER adoption pyramid framework and examined in context in the OERu's ecosystem. Thus, section 6.3 answers this guiding sub-question: **What are the stressors involved in OER engagement and OEP implementation?**

6.1. The foundations of OERu's course design

Foundational aspects of OERu's approach to course design are explored. The first sub-section explores the characteristics of openness that set the OERu's courses apart from traditional tertiary courses. The second sub-section explores the OERu's approach to pedagogy and how various participants viewed pedagogy in open courses. The third sub-section examines the resources that the OERu provided for designing and developing open courses. The fourth and final sub-section presents an anecdote of course design, development, and delivery by Wanda, in partnership with the OERu. This anecdote aims to consolidate knowledge about the OERu's processes and resources explored to this point. It also aims to present a short analysis of OER engagement before exploring the more complex case of LiDA. These foundations were manifestations of the OERu's commitment to openness and are major considerations in the design, development, and delivery of its courses.

Unique characteristics of OERu's courses

The OERu considered its courses to be distinctive from other tertiary-level courses in several ways. Learners could gain access to OERu course content without creating an account which allowed students to gain access to and explore course content anonymously. The course content was openly licensed and used open source software, which resulted in low production costs. Consequently, the cost of membership to the OERu was lower than the cost of hosting the OERu's infrastructure. Another characteristic is that the OERu provided a low-cost and low-risk opportunity for innovating with open design and open educational practices. These conditions had the potential to promote evolution of educational technology, with universities' ecosystems learning from each other.

The OERu's open boundary courses (see definition in Chapter 2) were enabled through open source technology and openly licensed content. Open boundary courses were not a required style of delivery, as will be seen in the vignette of IIIU in Chapter 7, where a course was designed to be self-directed. The OERu's open boundary courses allowed for the flow of information and various perspectives (energy) among learners. These courses were open to students who were registered at an OERu partner institution with the aim of obtaining credit. They were also open to students

located anywhere globally who were participating in the parts that interested them, and not for credit. Survey results presented below in the section entitled “Designing for unknown students” indicate that the majority of learners take OERu courses out of interest rather than for credit. Wayne_CD described the value contributed by having non-formal students participate in open boundary courses:

> The levels of engagement we have [in open boundary courses] are typically higher than the commercial MOOCs […] The free OERu learners that are participating in our courses just out of self-interest and not for getting formal academic credit are a very important component of our delivery model and design. Very often, these free learners, because of their interest in the subject, actually provide a high level of peer-to-peer support by virtue of their engagement in the courses. They are able to help and support those free OERu learners who are actually studying for formal academic credit.

The courses were neither generally taught nor facilitated by an instructor. Instead, the courses were designed to include opportunities for student-student interaction. The courses were Free Cultural Works which means that their licenses allowed users to share them at no cost, which reduced expenses for institutions. Learners had the autonomy to use technology as they chose for their learning. For example, a characteristic of open boundary courses where learners could have social impact is explained here:

> Unfettered access to our course materials recognizes the potential learning value of being able to fail anonymously. This feature could be of value to Indigenous learners, first in family university learners, and learners who may perform better without the time constraints associated with completion of traditional courses (Mackintosh, 2017, p. 110).

This flexibility increased the sustainability of the course ecosystem and gave learners the freedom to study at their pace and where they chose, just as with distance education. Examples of open boundary courses will be explored later in this chapter in Wanda’s anecdote and in the examination of the delivery of LiDA.

Another point is that the OERu allowed for a networked approach to developing and standardising its processes and products (OERu, 2016p). Additional characteristics of OERu courses were: they were required to contain a course guide, learning outcomes, resources, learning activities, and

assessments; a student needed to be able to receive credit from at least one partner institution for each course, and the accrediting institution could choose the type of assessment; the courses were recommended to be designed for a wide variety of learners since they were delivered with open admission online; and it was recommended to design courses to facilitate collaborative work among students to benefit from collective knowledge (OERu, 2015h). As will be seen in the anecdote of Wanda, and the vignettes of IIIU and EEEU, a variety of factors influenced the choices to adopt these features when designing courses for the OERu.

In mapping the course ecosystem within the Arena framework, the Course Developer (CD) in Figure 5.5. was positioned as the keystone species. This is because he was also the subject matter expert for the course in question and therefore had the greatest influence on course development. As the OERu CEO, he was also a keystone species in the organizational ecosystem. Hence, these roles were bridged across ecosystems. The CD depended on open source technologies as a course development platform and as tools for learners to use in courses. The OST supported this work by finding, adapting, and maintaining open source software to reduce costs and increase sustainability.

Pedagogy at the OERu

We now turn to the concept of open pedagogy. The OERu CEO in his keystone role of the OERu network did not dictate any single pedagogy; each partner institution was to have full autonomy in this regard (Wayne_CD). This means that the OERu supported any form of pedagogy as long as it did not require an instructor. Indeed, it will be shown in the examination of LiDA that the OERu provided its learners with support by sending them automated emails. The emails addressed issues such as technical support in the days leading up to the launch of OERu courses.

Despite the OERu CEO's position on pedagogy, attendees of the OERu's 2018 International Partners meeting were interested in developing this aspect of open courses. They put forth a definition of open pedagogy as presented in Chapter 2. According to that definition, learners were expected to

interact and to learn from each other. The reason is that the OERu did not offer tutorial support (Wayne_CD). Wayne_CD believed that Anderson's (2003) Theorem of interaction equivalence was a basis for this approach (Wayne_CD). Wayne_CD interpreted the theorem this way: "if you radically ramp up any one of the three forms of interaction, you can drop the others without any noticeable difference to learning outcomes." Further, Wayne_CD said that content guided course design. He also explained that his years of experience led him to believe that a variety of pedagogies contributed to achieving learning objectives. Wanda and Stephen_CD held views consistent with this position. Similarly, Rory was open to various pedagogies in an open environment. As a member of the OER Foundation's board of Directors, his view on this point supported that of the OERu CEO in his keystone role.

Another specific point about open pedagogy was that in OERu courses, Wayne_CD avoided disposable assignments, which were student works only seen by the instructor (Jhangiani, 2015, 2017). Stephen_CD and Wanda did as well. Trevor also avoided assigning disposable assignments, preferring to promote collaborative assignments published openly, such as developing Wikipedia pages. Further, they all said that they preferred to assign authentic tasks. No explanations were given for these preferences.

Considering that the OERu delivered education using processes that were open to the global ecosphere, I considered whether the OERu CEO was interested in developing a form of catalogue of teaching and learning methods for an open environment. Suggestions from John_AD with the same objective of helping to guide course design will be described in the next section. When I asked Wayne_AD about the catalogue, he responded that the OERu offered courses to this effect. He also explained these courses were not a priority; he was instead focused on releasing courses intended for the exit qualifications.

Having grasped the OERu CEO's perspective on pedagogy, I turned to Rory for his view. I asked him about how he saw pedagogy being informed by learning theories. He responded that he observed that faculty did not always fully adhere to the learning theories they claimed to use; the intentions and actions were often inconsistent. He also reported that faculty could react strongly when confronted with this point. This type of difficult interaction shows what kind of limits of influence keystone species can have, as Rory was both as a leader at his institution and at the OERu. One point that did shape how PIs designed courses for the OERu was that they sometimes followed the modality of the PI. That is, Rory's institution offered self-directed courses, and similarly shared self-directed courses for the OERu, whether they were developed from scratch or borrowed from another source. Stephen_CD's institution followed a similar approach as will be seen in IIIU's vignette.

In summary, the OERu took no position on pedagogy except that student-student interaction was favored due to a lack of tutorial support in its courses. Additionally, the OERu CEO was not motivated to stimulate this evolution as his priority was to develop the exit qualifications. The interest in open pedagogy and the application of learning theories was driven by individuals partaking in OERu activities. This point is complementary to the OERu's drive to evolve its technological resources. Thus, within the OERu's system, co-evolution of education and technology resulted from PIs' and the OERu CEO's respective interests.

Resources and processes related to open design, development, and delivery at the OERu

OEPs of open design and development of OER are explored, as is the issue of designing for unknown students in an open and online platform. Suggestions for improving the OERu's course design processes are described, as are a variety of resources to support open design found on the OERu's WikiEducator planning pages. They include templates and courses on the design of open courses. An anecdote will illustrate the resources and processes used when Wanda worked with the OERu CEO to develop its first micro-course.

Open design and development at the OERu

Matter and processes used to develop courses as OER by the OERu differed from those used by two PIs. The examples below provide a comparison of agile and production-like course development as open educational practices. As indicated by Rory, Wayne_AD, and Stephen_CD, Partner Institutions had the autonomy to design courses in various ways.

Mackintosh (2017) explained open design at the OERu this way:

> Open design refers to the creation and development of potentially meaningful learning experiences through open and transparent collaboration among course developers and peers using open educational resources, open educational practices, and open technologies. OERu design and development begins with a simple premise that it is more productive and sustainable to reuse and remix existing resources than to create new ones from scratch. It requires an agile disposition to assemble learning pathways which utilise existing OER and open access resources to support the learner's journey in attaining the learning outcomes. The open design process is highly iterative. Unlike production-line models found at many open distance learning institutions which develop a 'master design plan' which provides detailed direction of the development, the OERu design process accepts that we are more open to iterative change as the development process progresses. […] The concept of open design extends the principles of openness beyond OER materials themselves to include open planning, open design and open development of courses. Open design refers to the dynamic processes for open collaborative design and development of open courses. It draws on the open source software development model to facilitate rapid prototyping and continuous feedback and improvement loops (p. 108-109).

For Wayne_AD, the process of course design for the OERu began with at least one OERu partner accepting to assess a course for formal academic credit. In addition, Wayne_AD explained that the OERu was required to produce content only as Free Cultural Works (which have CC licenses of CC-BY, CC-BY-SA or are made available in the public domain). The OERu had blueprints to guide the design of OERu courses, and the blueprints were simpler than in the process-like instructional design approaches, according to Wayne_CD. He explained that the blueprint could be simpler than plans used in traditional processes, because open design allowed for flexible, iterative, and agile planning as described by Raymond (1999). Wayne_CD also applied the open source community's process of "rough consensus and running code" for decision making in course design to guide the agile process.

Trevor supported the view that agility differed from traditional online course development. At his institution, online course development could take up to two years and involved a variety of developers. Therefore, course changes were not likely to be immediate, and he could not obtain immediate feedback from students on the effectiveness or appeal of the changes. This reflects the "cathedral process". When he would suggest changes in face-to-face courses, it was much easier to implement them and obtain student feedback. This process differed from the one that will be described in Chapter 7 by Trevor's colleagues at IIIU, in which Stephen and Samantha developed a course. They did so using their personal time as a one-time occurrence. Subsequent course development for the OERu was completed during normal work hours. They involved usual practices, which were modified only in that technological developers were using WikiEducator coding. Thus, what began as an agile process became a more traditional one, because it was more sustainable for the employees and the institution.

At Athabasca University, there were different OER-development processes. Rory explained that one approach was for a person working in IT to extract content from courses found in repositories like that of Saylor.org and insert them into the WikiEducator platform. Alternative methods involved a faculty member or tutor developing an open course independently, an instructional designer working with a technological developer, and a keystone species such as a subject-matter expert. Course development could occur in partnership with organizations such as UNESCO, which was an influential organization in the political sector of the global ecosphere. Development steps included verification by copyright officers and copy editors. When converting courses to OER, sometimes commercial content needed to be removed from a resource to be replaced by material with suitable CC licenses found on the internet. Rory called this process "deboning" and a similar process was applied in the anecdote of Wanda and the vignette of IIIU. Rory concluded his explanation by stating that faculty, as a keystone species, held the authority over content and quality decisions.

In summary, course development processes differed based on the keystone specie leading the project. The organizational ecosystem's culture of agility at OERu contrasted with that of IIIU. At the OERu, development fell along the spectrum of agile-traditional processes and included possibilities involving partnerships. Despite their differences, these processes resulted in OER nonetheless. Hence, the influence of the OERu across the network did not always lead to Partner Institutions adopting its OEPs. Rather, the PIs developed processes that worked within their ecosystem's organizational cultures, and under the influence of their respective keystone specie.

Designing for unknown students

The process of course design is facilitated by knowledge about the target audience. For example, collecting information about intended learners is part of the "Analysis" step of the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) course design model (DeSimone, Werner, & Harris, 2002). Similarly, the first step of the design thinking methodology is to empathize with the intended learners (Henriksen, Richardson, & Mehta, 2017).The process of data gathering informs the design of learning activities, and the choice of technology and media, among other course features. These features are aligned with course-level and program-level objectives based on course quality standards (QualityMatters, 2020). However, the OERu faced a challenge in gathering such knowledge about its intended students who were from various international cultures. A challenge that John_AD encountered was to structure his course while not being aware of who might take it. In his words:

> I've raised this at the Partners meeting this year [2017] and a number of other institutions felt very similar that they weren't entirely certain who the student was that they were designing for. And some of the rhetoric doesn't quite always match up, if you would. Because sometimes we're talking about students who have a poor internet connection, have not had positive university experience beforehand or perhaps no experience with tertiary education beforehand. We talk about providing digital literacy skills and the like, but then on the other side, we are saying to students 'When you join the OERu, we want you to set up this account' and 'please pick a blogging platform' and I think there's a lot of disconnect between some of the rhetoric about who the students are and the types of skills we're expecting them to possess and the assumed knowledge they have.

This quote suggests that John_AD felt that there were areas for improvement for using OEP differently in a pedagogical sense to better meet the needs and match the abilities of the target students. Wanda had a similar experience, and like John_AD, felt that it was important to design a course based on knowledge of the intended students, and at the same time, did not know who the OERu students were. She said,

> One of the aspects of developing courses for the OERu is that there are many unknown characteristics about the students, such as the number that will participate in the course and where they are from in the world. Yet, one of the characteristics of a good teacher is to know your learners. I suppose that I learned a bit about who OERu students can be. The pilot was offered twice and it was largely taken by members of the OERu community. I'm still not sure who the OERu learners are.

One reason that Wanda felt unsure of who the learners of her course were could be that her two-week-long open boundary micro course was too short to get to know the non-registered learners. Despite her lack of knowledge about the non-registered participants in her course, it will be shown in Wanda's anecdote that she used several pedagogical techniques including scaffolding to facilitate the learning experience.

Wayne_CD acknowledged that little was known about students who took OERu courses and explained that, by definition, open courses allowed anyone to study. In the absence of knowledge of the students, courses were guided by learning objectives. Since the time of the interview with Wayne_CD, the OERu conducted a survey to gain information about OERu learners. A summary of the methodology and findings were provided:

> An optional New OERu Participant Survey was administered. While the sample is still too small (N=59) to generalise findings for the OERu, the following data provide some insight into the characteristics of the learners who participated in the inaugural cohort. Learners ranged from 25 to 60 years of age, with one in five respondents falling in the 46 - 52 age group. Half of the learners indicated English as their primary language. Respondents who chose to identify their gender identity, demonstrated that 64% were female. The majority of respondents (66%) were in full-time paid employment. Professional development (50%), followed by reskilling for a new career (17%), and personal development (17%) were cited as the main motivations for taking an OERu course. Approximately one in three respondents confirmed that they were planning to acquire a micro-credential, and an equal number indicated that they were thinking about completing a micro-credential. Clearly, the micro-credential model is of interest

> to the individuals who completed the survey, with only 12% confirming that they were not interested in pursuing microcredentials (OERu, 2018h).

It is not clear from these findings what proportion of the surveyed learners were excluded from traditional tertiary education.

OEPs to support course design

As an instructional designer, John_AD had suggestions for the OERu to facilitate the course design and development processes. The first suggestion was to see the OERu provide a bank of tagged examples of assessments or applications of learning theories that course developers could consult as a reference. In other words, John_AD wanted to see the OERu implement a metadata system for searching through its courses and discussions efficiently. These ideas represent potential ways in which the OERu could evolve technologically to improve educational practices – in short, co-evolution of technology and education.

The second suggestion was to have the context of an OER provided to understand how the course should be used. John_AD gave the following example: it was insufficient to have an OER described as being intended for undergraduate business students since many such courses existed for any given university. A third suggestion was for the OERu to dedicate space for instructional design resources. He commented,

> I know that the ethos [of the OERu] is not to dictate a pedagogical approach or essentially say to the partners "This is how you teach, this is how you assess". And that's something that I'm very respectful of. I think that's a brilliant way of approaching it. However, there's a big difference between saying "You can use whatever approach you consider to be sound" and […] "There's a whole range of different approaches and no matter what you pick, there's going to be some support for it." So I think it is a case of giving people choice but then, when they have made that choice, they feel supported.

This kind of support would have been useful to him when he started designing and developing OERu courses, as he reported. It would have allowed him to learn about the affordances of the OERu's technologies and educational approaches. These suggestions represent examples of self-organization to curate OER matter available in the global ecosphere and evolve to provide guidance to course developer species new to working with OER.

Resources for open design

While the OERu did not have a collection of learning activities or a metadata system for tagging its resources, it did have some resources for guiding course design that were in varying stages of development and application. Provided is an overview of the resources, which were found in an online manual about course design and development for the OERu. The OERu first began to prepare a manual entitled “OERu partners and course design and development manual” in 2014 (OERu, 2014c). The manual was in early stages of development, and the majority of its content was stored on a brainstorming page (OERu, 2015h). On that page, the section “Design and Development of an OERu Course” contained the most information. It began with a suggestion that a course development team could consist of people with different skills and knowledge. The section continued with a description and links to development tools mostly for WikiEducator coding plus links to the following resources:

- CollabOERate
- OERu Course Style Guide
- Quicklinks for OERu developers
- Digital Toolbox
- Design Template #1 (Course planning homepage)
- Design Template #2 (Design blueprint)
- Courses on how to develop openly licensed online courses.
    - Digital Skills for Collaborative OER Development.
    - Curriculum design for open education.
    - Open content licensing for educators.

CollabOERate was described as:

> a thought leader's and practitioner's petri dish where OER futures are cultured for the benefit of individual OER projects around the world. CollabOERate is the OER equivalent of research and development (R & D) for new "product" design in open content and open education. CollabOERate is successful when it succeeds in growing the OER ecosystem in a sustainable way (OERu, 2010).

This CollabOERate page was last edited on April 1st, 2010. Given the lack of participation in the CollabOERate initiative, it appears that the OERu’s organizational ecosystem did not re-organize to form a research-and-development team for the OERu. However, research on OER and OEP has been conducted outside of the OERu despite this initiative, as shown in my literature review.

The OERu Course Style Guide (OERu, 2016ag), provided guidance on attributing content, how to use WikiEducator coding, and how to format text. There was a link to a page called "Quicklinks for OERu developers" containing various coding templates for a course (OERu, 2015j) and a link to a Digital Toolbox (OERu, 2016e) consisting of tools organized according to learning functions: communication, collaboration, critical thinking and problem solving, and creativity. This page was last edited on September 28th, 2016, so some applications may have ceased to exist. The "Design and Development of an OERu Course" section contained guidelines on collaboration and communication using the OERu's open platforms and a link to a list of communication tools (OERu, 2015d). There was also a subsection with resources to guide OER development and to provide links to banks of OER. The final subsection was on Learning Design and offered the following guidance:

> Designing an open course builds on the foundational principles of quality course design:
>
> - Learning outcomes that meet the needs of learners and support assessments.
> - Learning activities that engage students and promote higher order thinking skills
> - Formative and summative assessments that link to the course learning outcomes
> - High quality OER (or links to external free resources) that are appropriate for the level of the course
>
> However, there are some additional factors to consider for open courses:
>
> - Flexibility in Design, Development, and Deliverability: This allows students to choose their own pathway based on their unique learning needs (Porter, 2011[1]).
> - Diversity of Learners: Students may have varied cultural, educational, and employment backgrounds.
> - Situated Learning Context: Since open courses cannot be made to suit everyone's specific context, so all students and instructors are encouraged to adapt to their needs.
> - Assessment: OERu courses need to include assessments meets the needs of both credit and non-credit students (OERu, 2015h).

As one would expect with online content developed over time, some of the links were broken. The page contained several links to fully developed courses to serve as models for course development. This material approached what John_AD wanted to have as examples of learning content for

designing open, online courses. However, he wanted more granularity in the form of tagged learning activities as examples of different teaching and learning approaches linked to learning theories.

An assortment of tools was located on a planning page of the Course approval and quality working group (OERu, 2016aa). The resources included course templates:

Design Template #1 (Course planning homepage). This was a template containing sections for the project management of developing a course (course topic, due date, progress rate, team members, project schedule) (OERu, 2015f).

Design Template #2 (Design blueprint). This was a template containing spaces for the Course description, the Design approach (a table for aligning assessments with learning outcomes), an Overview of the delivery model, OERs on the topic in question, a Summary of the interaction strategies, the Online tools that students may need, and potential sources of formal credit (OERu, 2015g).

In addition to its tools and guides, the OERu and its partners had developed courses about designing and developing OER. One course was called “Digital Skills for Collaborative OER Development”. It was “a hands-on course where you will learn and demonstrate your skills in using digital technologies for collaborative OER development, culminating in the development of an OER learning sequence to be published on the open web” (OERu, 2015c). The course content was found at two sites (OERu, 2015c, 2016d). Another course entitled “Curriculum Design for Open Education” was described as “An open micro course for learning and teaching practitioners in tertiary education to explore, evaluate and adopt open educational practices (OEP) through key aspects of curriculum design” (Bossu & Fountain, n. d.-b). The key topics of this course were:

- Learning outcome frameworks
- Learner contexts
- Design for learning in open education
- Resources and technologies
- Assessment and OEP (Bossu & Fountain, n. d.-a).

This course was mostly developed by two people from an OERu partner institution - as revealed in the "View History" section of several course pages - and with the support of the Australian Government (Bossu & Fountain, n. d.-a). The course content was found at two sites (Bossu & Fountain, 2017, n. d.-b). The last of the three courses was entitled "Open Content Licensing for Educators" and described in this way:

> This micro Open Online Course (mOOC) on open content licensing introduces the concepts of open education, copyright and Creative Commons as a contribution from the OER university collaboration and the UNESCO-COL OER Chair network in widening knowledge and capacity development in support of the global open education movement (OERu, 2013). The course content can be found at two sites (OERu, 2014d, n. d.-g).

It is not clear whether these courses have been offered, and if so, when or to whom. They were not listed among the options of the OERu's "Course page" (OERu, n. d.-b); and one needed to search Wikieducator.org to find them to explore the course content. Considering the potential value of these courses in supporting people developing courses for the OERu, I asked Wayne_AD why they were not placed on the Course page. He responded that promoting these courses was not among the OERu's current priorities. Rather, the priority was to complete the development and provision of courses for the OERu's first year of study. A different perspective on these courses is that they did not quite fill the gap that John_AD mentioned of having an ever-increasing bank of specific and searchable examples of educational activities. The course on curriculum design, which was designed by individuals from a PI, focused more on pedagogy, so it perhaps provides some of the type of support that interested John.

The courses on digital skills and open content licensing were mostly developed by the OERu CEO (OERu, 2014d, 2016d) and focused on technical skills and how to use Creative Commons licenses. Indeed, many of the resources listed in the OERu's manual about course design and

development provided guidance in using technology. This was perhaps based on an assumption that course developers and instructors needed support the most in this area, rather in learning about teaching and learning practices for using the technologies. This focus on technology in course development was consistent with the OERu's general practice. The "Curriculum Design for Open Education" designed by individuals at a PI complemented the two other courses in that it focused on pedagogy. Thus, the OERu provided resources with the potential to stimulate technological evolution, while a PI did the same for educational evolution.

The OERu had implemented OEP with attempts to support its PIs in producing OERs by providing information and tools for course development. CollabOERate was an attempt to bridge organizational ecosystems within the OERu network. It is not clear how frequently the tools were used by PIs or updated by the OERu. As for the CollabOERate initiative and course design and development manual, they were evidently abandoned. Thus, strengthening of the OERu ecosystem and educational evolution through these innovations was stalled. The tools and resources were perhaps set aside to await iterative development through the OERu's agile process. It is not clear whether the development of these resources was stimulated by demand from PIs, or to what extent they aligned with what different PIs wanted or needed for OER development. The anecdote in the next section and the vignettes of IIIU and EEEU will show how course developers at the OERu's PIs designed and developed courses. Their work was shaped by conditions such as their level of knowledge of OER and pedagogy, and on available institutional services and on institutional requirements.

Anecdote of a partnership between the OERu and a founding partner

To this point, section 6.1 has explored various aspects of open design involving the OERu. This anecdote provides an illustration of how processes of open design were applied in 2013 when Wanda, a faculty member at a PI, worked with the OERu to design, develop, and deliver a micro-

course. This illustration is intended to facilitate the understanding of the application of OERu processes in partnership with a PI. It is also intended to serve as a stepping stone of understanding before examining the larger case study of the OERu's design, development, and delivery of LiDA that will comprise section 6.3. The vignettes in Chapter 7 will show the type of OEPs that PIs implement when designing and developing OER more independently.

In the OERu's early years, Wanda converted a two-week portion of one of her accredited university courses to an open boundary course for the OERu with the help of the OERu CEO. As the subject matter expert and the person leading this project at her institution, she was the keystone specie within both the course and organizational ecosystems. The OERu CEO was in a supporting role within the course ecosystem and a keystone species within the OERu. Both of them were assisted by people in an IT role at their respective institutions. These mentoring and supporting activities were examples of spreading energy by sharing knowledge across ecosystems. In this anecdote, the students registered at Wanda's institution who were taking this course for credit will be referred to as students, while those not registered there will be referred to as learners.

Wanda had the mindset that the OERu CEO promoted in his desired culture of learning to share: she had no objection to copying openly licensed content. Indeed, she found it useful to reuse mind maps from previous courses, for example. However, she was neither fully clear on what "open" meant nor how strict the definition of "open" could be. She explained,

> The context is limiting and enlightening. I've always wanted to have education as accessible and equitable as possible, but I hadn't thought through what was, if you like, opening and closing such things. It was in working with Wayne that he would say "we can't do that" because... He was opening my eyes as to what were equitable practices and which were not. Use of proprietary software is one example. I don't think that my use of proprietary software like Windows Explorer in an open course closes education. To some extent, restricting students [and learners] from using proprietary software might close education. Firefox, as a non-proprietary browser is important, and it works better with open resources than proprietary software. There were some journals that were not as open as I had thought, which was surprising.

In addition to the challenge of making sense of open education, Wanda had difficulty finding relevant content for her course. Fortunately, the OERu CEO obtained materials through his network. The OERu CEO's access to a global ecosphere of relevant course material was an argument for promoting inter-institutional collaboration. Such a collaboration could reduce the energy expenditure on course development and render the whole ecosystem more sustainable for the institutions involved.

Wanda described the process she undertook with the OERu CEO as a course re-creation. They used a table for structuring and curating materials to create one unit at a time (Davis & Mackintosh, 2013). Wanda proposed content that she had used in her course, and the OERu CEO double-checked the sources to determine what the license permissions for legal reasons. This is the "deboning" process mentioned by Rory. Sometimes, the content needed to be recreated and given a CC license, which was a stressor in that it consumed time. However, it also promoted "learning by doing", which was a form of learning that Wayne_AD promoted within the OERu. The content was organized in the table by unit and according to the licensing details.

Another part of Wanda's process was to determine how to use the resources. She explained that some resources were placed in WikiEducator, while others were recorded and linked in to the course. Wanda mentioned an additional challenge to using OERs: assessing the quality. She elaborated,

> It is a challenge for those using OERs to determine the quality. If it's free, it can be seen as being of low quality (you get what you pay for). If you do invest in using OERs, it's a challenge to determine the source and to determine whether quality assurance processes were used.

Thus, the challenge of verifying the quality and finding the source of content were stressors for course developers.

As for pedagogical decisions about course material, Wanda provided different perspectives on learning theories with her experience and research involving online education. She considered herself to be pragmatic; she applied several theories in the same course if she thought they were useful. However, she tended to exclude behaviorism. To promote social learning, she used blogging and micro-blogging. For students who did not like using blogs, she offered cognitive or constructionist work involving mind maps, for example. She also liked to include authentic tasks by having students apply theories to their context.

Wanda's institution used Moodle, and this course was the first instance of the OERu using the WikiEducator platform for this purpose. Wanda assisted in establishing contact between OERu's open source technologist and the IT support staff at her institution to gain access to Moodle. The aim was to adapt the source code to access the content developed in WikiEducator. This example of collaboration was a stressor in that it enabled course development to proceed more effectively. The collaboration was facilitated by the working relationship that Wanda and the OERu CEO had built, and with Wanda acting as a bridge between the OERu and her institution. This course innovation also illustrated the interaction between the OERu, Wanda's institution, and the NZ federal government. The government had previously invested funds to make Moodle a more scalable platform for the country's tertiary education institutions (Mackintosh, 2012). In short, these interactions across the ecosystems led to the evolution of a course hosted in the Moodle platform to link with content from WikiEducator's open online platform.

Wanda told of her experience as a first-time facilitator of her micro-course. This was the first OERu course to use micro-blogging and blogging, so there were no other OERu courses to refer to for managing the course feed. However, there had been MOOCs offered by other providers at that time that could have been examined to determine how learners communicate in open online educational environments. This was also an innovation in that it was an open boundary course, meaning that

students registered for the course at Wanda's institution could receive credit and were members of the organizational ecosystem. Learners located anywhere within the global ecosphere were invited to participate, but without credit. Their participation acted as a stressor in that it was intended to increase the richness of discussions based on various international perspectives. Wanda explained that "[a] challenge was to get the students [and learners] to contribute enough content using micro-blogs and blogs. I was going from using closed forums to thinking about how the students could work in an open way". When I asked Wanda how she perceived the role of blogs and microblogs in online courses, she said that she viewed micro-blogs as a substitute for discussion forums and blogs, for graded assignments. The change of leading courses within a LMS for her institution's students to a more open online course was thus a stressor requiring Wanda's approach to education and technology to evolve.

In addition, Wanda felt that the aggregated course feed of posts from blogs and micro-blogs was chaotic, explaining that it could contain a series of tweets that were separated from each other rather than being threaded. As a solution, she provided summaries of threads of ideas so that the aggregated feed could make more sense. Wanda said that there was a high level of engagement during the two weeks that the course was open, though the students and learners couldn't have kept up that pace for a longer period (Davis & Mackintosh, 2013). In other words, the high volume and chaotic order of the posts was a stressor for Wanda and the students and learners. Additionally, the two-week course was too short to develop students' and learners' leadership skills as Wanda reported. However, it was long enough to perform analyses and to stimulate further thinking.

In her course, Wanda used an open source mind map. The interactions among students and learners enabled by the mind map made the activity scalable. She had them write short blog posts as scaffolding for a larger project: an essay. Such scaffolding and chunking were stressors in that they enabled students to organize their study tasks. Wanda also used a scaffolding approach for the

benefit of international students and learners whose English skills or essay-writing skills were weak, and for working students who could only study in small blocks of time. In these examples, evolution of Wanda's teaching occurred only technologically, and then, only through the adoption of open source tools. Her teaching approaches did not change; they had already been designed with international students in mind for previous offerings of this course in its closed modality. Consequently, she was able to continue using them in this open boundary course.

Looking for a moment beyond Wanda's instance of the OERu course, another stressor that Wanda described was that copying someone else's course in a LMS shell resulted in the messiness of having several open versions of it. For example, she sometimes found material in unexpected places within a course that had been taught by a colleague. A similar stressor was that open courses sometimes linked to content that was no longer relevant. Wayne_CD addressed this point by indicating that such issues needed to be considered during the course design phase. Some solutions he suggested included tags and hashtags in his courses to help sort the content. Wanda mentioned the potential for messiness or chaos when a course was delivered multiple times, where several versions of a course existed on the Internet, or where versions developed by previous instructors contained instructions contrary to her intentions. There could also be different versions of content on various platforms (e.g., Moodle, WikiEducator, blogs). Another stressor that Wanda mentioned was that there could be a great amount of student work online from previous offerings of a course, which led to concerns about plagiarism.

To summarize Wanda's anecdote, two keystone species whose ecosystems were aligned formed a mutualistic relationship in a course ecosystem. This ecosystem was successful in evolving from a closed LMS into an open boundary format. It evolved pedagogically as Wanda adapted the use of open source tools by applying scaffolding techniques and reducing students' and learners' stress of managing the large flow from the aggregated course feed. Stress reduction was intended to prevent

students and learners from leaving the course ecosystem. The interactions among students and learners included enriching exchanges of international perspectives on the subject matter. By delivering this course twice, Wanda evolved through her learning about the concept of openness generally and in terms of OER and open source technology more specifically. The learning occurred through what the OERu CEO had described as an apprenticeship and "learning by doing". The OERu CEO benefitted by learning from this experience. It was the first collaboration of the OERu with a PI to develop and deliver a course and to mentor a faculty member about open education, OER, open licenses, and open source technology. It was the OERu's first open course delivery and its first use of open blogging and micro blogging.

6.2. Observations of the design and development of LiDA and the delivery of LiDA103

The design and development of the Learning in a Digital Age course and the delivery of one of its four component micro-courses: LiDA103 are explored to gain insight into open design and delivery. The findings capture the essence of OER engagement: an OER being developed by remixing two existing courses and adding new material using open source technologies and open processes, where anyone with access to the Internet could participate. A detailed analysis of procedures will be provided which can be adopted by those interested in OER engagement. The analysis using the Arena frames how species across the system interacted with matter. It also helped to determine the types of interactions that were sustainable and led to the system's evolution towards a greater understanding of open design, development and delivery processes. Knowledge produced by this analysis can facilitate the adoption and adaptation of these OEPs in other tertiary education institutions.

Design and development of LiDA

The points that will be examined are the resources and design processes used during the design and development phases. They include the LiDA course planning page, the open design processes of crowdsourcing for suggestions about curriculum topics, the use of Kanban boards for storyboarding, an online meeting about LiDA, and the forms of communication used while building the LiDA course.

The exploration of these topics facilitates an understanding of what open design and development of an OER looks like when the processes, resources, and tools are all open.

LiDA course planning page

The main planning page for LiDA (OERu, 2018b) contained the names of the design and development team members, a link to the Groups.OERu discussion forum that was used from April 22nd, 2016 until August 20th, 2017 and contained 20 discussion threads. It also contained an email list and a link to the course's Kanban board for organizing the curriculum topics. There were links to planning documents containing course specifications for the OERu and for Otago Polytechnic (the institution that accepted to accredit the LiDA course), a design blueprint that remained blank, placeholders for links to descriptions of the four micro-courses composing LiDA, and a link to a text that was recommended for this course. The textbook carried a CC-BY license and was provided by a publisher of open online textbooks. There was a link to a page for curating resources to possibly include in the course and to a page containing elaborate plans for the course based on similar existing courses at Partner Institutions. The content from those courses was mapped out and used to design the curriculum of LiDA (OERu, 2017c). There was a page that contained the announcement for a crowdsourcing activity to collect ideas for course content plus the obtained responses, and a second link to the Kanban board mentioned above. The crowdsourced topics were added to those that had previously been assembled and were organized using the Kanban board in Figure 6.1., as explained in the video-recorded meeting for planning the development of LiDA (OERu, 2016j). There were links to micro-course specifications used to obtain approval for credit, links to minutes and Zoom spaces for meetings about course planning, and a link to a blank quality assurance checklist for one of the micro-courses. It also contained a link to a page containing the full course outline and links to both the WikiEducator pages for editing content and the WordPress pages for the published version of each micro-course (OERu, 2018b).

The OERu course specification page contained information to guide course development, metadata about the course, such as the level (first year of a Bachelor's degree), the titles of its component micro-courses, and the assessing institution. It contained the course aim, learning outcomes, and outline of the content, shown here:

> LiDA will implement discovery pedagogy where learners are guided to search, identify, evaluate, select and share appropriate resources in achieving the learning outcomes in pursuit of their own learning interests. Indicative topic areas:
>
> - Digital and academic skills for online learning
> - Digital citizenship
> - Open education, copyright and open licensing in a digital world
> - Critical media literacies and associated digital skills (OERu, 2016i).

The specifications page also contained information about assessment, requirements for passing each micro-course, pre-requisites, detailed objectives for each micro-course, and a link back to the planning page. It also contained links to both the WikiEducator pages for editing content and the WordPress pages for the published version of each of the micro-courses (OERu, 2016i). Two fields that were not filled were: *Development and delivery approach* and *Interaction strategies*.

In short, the course planning page and specification page acted as stressors in that they enabled both communication and course design. The planning page linked to design resources (storyboard, curated resources, mapped course content, crowdsourced ideas), documents for official use (specifications for accreditation), and development resources (editable course pages and published course pages). As for the course specifications page, its important points were the course goals and intended outcomes, assessment information, objectives for each micro-course, and links to the development and published pages for each micro-course. The course specification pages contained many of the fields found in the design blueprint. These pages were used for structuring and developing the course content, addressing administrative and accreditation issues. However, they were not used to address the topics of *Development and delivery approach* and *Interaction strategies*. These findings suggest that the focus of using these planning pages was emphasized for process rather than pedagogy.

Open design: Crowdsourcing to develop the course curriculum

A crowdsourcing activity to collect curriculum suggestions for LiDA was conducted using several online platforms by the OERu. The crowdsourcing was announced using Twitter (OERu, 2016ac), the LiDA Groups forum (OERu, 2016b), and WikiEducator (OERu, 2016h) on April 29th 2016. These platforms reached different ecosystem communities, while the ideas were collected in a Google Doc. There were some responses on Twitter on May 1st and May 8th 2016 using the "#OERuLiDA" hashtag from the OERu CEO's account (@Mackiwg) and not that of the OERu (@OERuniversitas), which had fewer followers. The responses were questions or a suggestion to consult a resource. There were no responses in the Groups forum, and it could be because only 18 people were subscribed to that page, and the instructions directed people to provide contributions on the other platforms involved in this activity. The OERu CEO and four other people edited the WikiEducator page to add or edit ideas. One of those people asked a question in the page's "Discussion" tab and received a response from the OERu CEO. It is not clear how many people contributed to the Google Doc since only two people identified themselves as contributors. The version history of the Google Doc revealed that it was edited from April 29th to May 10th 2016. This crowdsourcing activity resulted in participation from the global ecosphere, so it was surprising that this approach was not repeated subsequently to build on the attained momentum. By giving species in the global ecosphere opportunities to participate in course design activities, the OERu was promoting the evolution of educational technology that could stimulate further evolution or co-evolution in local ecosystems. The awareness raised could also help the OERu to increase its sustainability if it showed that it was welcoming and building on the ideas contributed globally.

Open design: Kanban boards for storyboarding

On the main LiDA planning page were links to a Kanban board entitled "LiDA Curriculum storyboard" (OERu, 2017d). The full board is shown in Figure 6.1. It is not legible as shown and is not intended to be read. Rather, the intention is to show the entire board. An expanded version of a section of it is provided in Figure 6.2. The board was organized into columns at the top of which were five titles.

The first four were micro-courses that comprised LiDA. The fifth column listed topics that eventually were integrated throughout LiDA:

- Micro 1: Digital skills for online learning
- Micro 2: Open education
- Micro 3: Media literacy
- Micro 4: Digital citizenship
- Micro 5: Independent self-directed learning

In each column were cards containing topics for each micro-course. Board users could change the cards from one location to another and click on the cards to add comments. A Kanban board is an open source tool (OERu, 2016j) that, according to the OERu CEO, is used in Agile software programming. He explained further:

> Imagine columns: Things to do / Doing / Done [see Fig. 6.3]. In each of those columns, you can put little cards of things that need to be done within a development. As the development progresses, you can move those cards to the "Doing" column, and then to the "almost done" column and then to the "Done" column. What you can do is assign different individuals on the team to different cards. We use an open source Kanban board call Wekan. It's very similar to the proprietary service Trello (OERu, 2016j).

Wayne_CD went on to explain that Kanban boards were easier to use than Gantt charts, because one would spend more time updating a Gantt chart than developing a course due to all of the interdependencies. In an open design mode, different people could work on any part of the course, as opposed to working in a linear and sequential way in traditional course development approaches. Thus, a Gantt chart would become too complicated to use in open development (Wayne_CD).

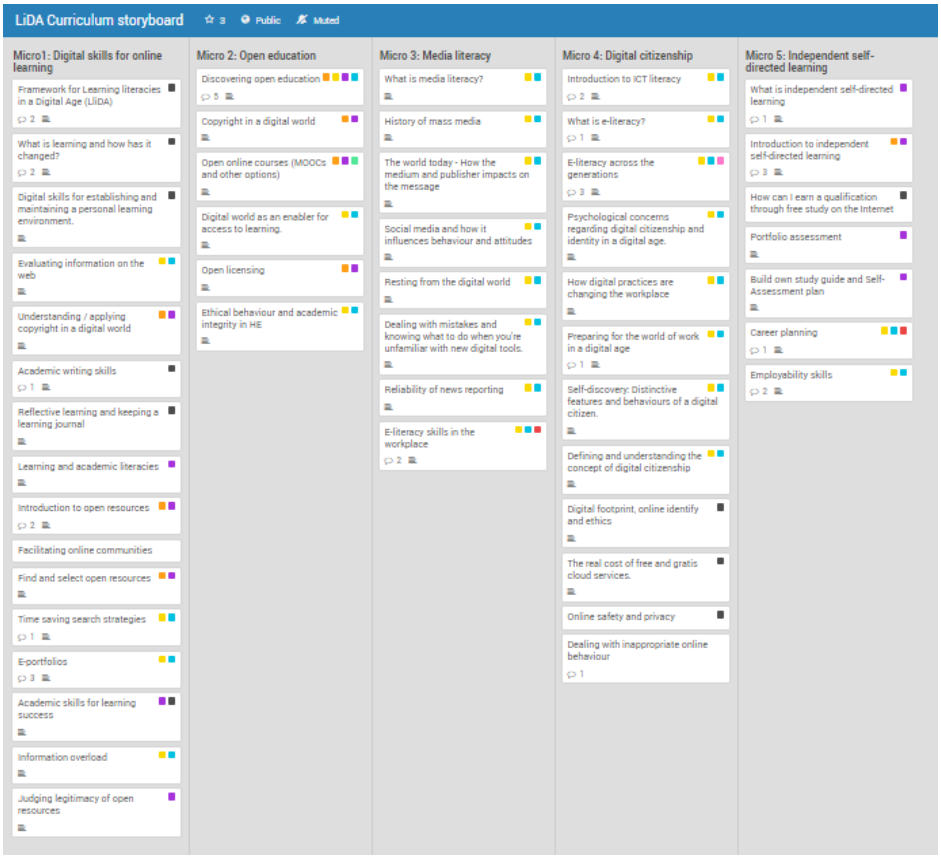

Figure 6.1. Kanban board entitled "LiDA Curriculum storyboard". Screen capture taken on January 10th, 2018

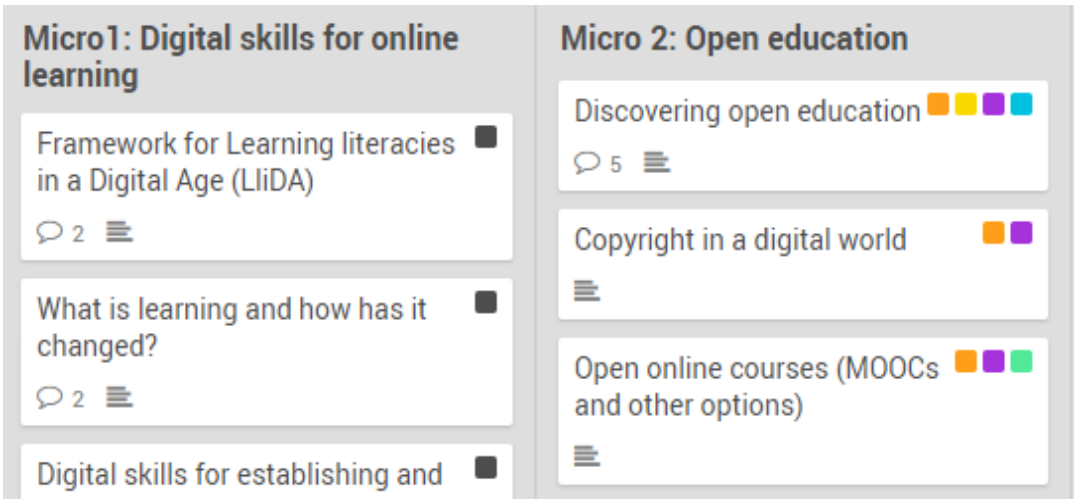

Figure 6.2. Expanded version of top-left corner of the LiDA Curriculum storyboard. Screen capture taken on January 10th, 2018

Another Kanban board entitled "Learning in a digital age" was used (see Figures 6.3. and 6.4.) (OERu, 2017a) and was mentioned in the LiDA meeting. It was not linked on the LiDA planning page, but the

URL of the board was visible in the video, enabling viewers to type it into a browser address bar and gain access to it.

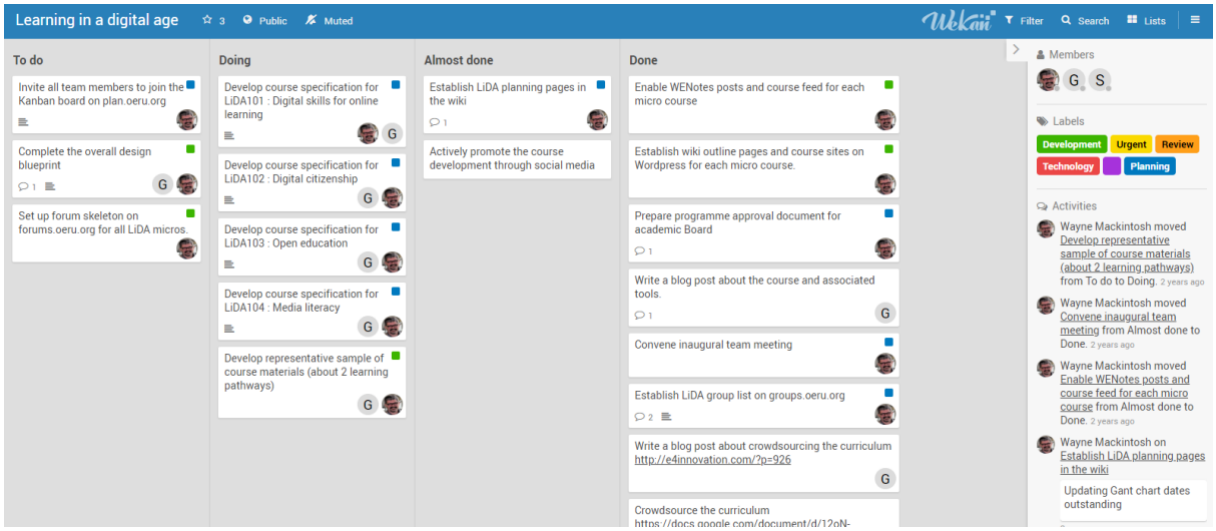

Figure 6.3. Kanban board entitled "Learning in a digital age" used for planning the course curriculum. Screen capture taken on January 10th, 2018

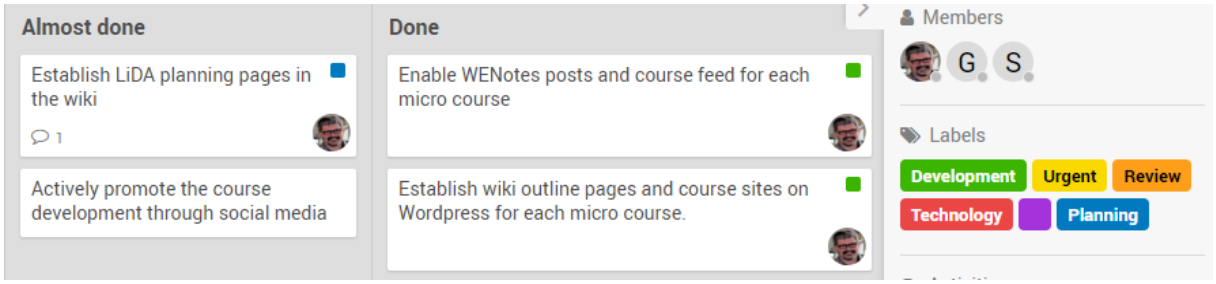

Figure 6.4. Expanded top-left corner of the "Learning in a digital age" Kanban board. Screen capture taken on January 10th, 2018

As of Jan 9th, 2019, I could not access either Kanban board since they had been decommissioned (follow-up with Wayne_AD). Thus, the openness and transparency of some planning pages was time-limited. Anyone interested in learning how to use these boards could consult the video about LiDA where these boards were presented. However, it wouldn't be possible to explore functions and comments as used by the OERu. I found no other Kanban boards during my research on the OERu's WikiEducator pages.

Online meeting about LiDA

On June 3rd, 2016, ten people, including executives from the OERu, instructional designers, marketing professionals hired by the OERu and people in additional roles from various locations met online meeting to discuss LiDA's curriculum. This meeting highlighted the significance of LiDA and its development process:

1) It can benefit every learner entering tertiary study
2) It is the first OERu open consultation to develop the curriculum outline before finalizing the course outcomes to maximize reuse potential for Partner Institutions.
3) It is the first OERu development that has been derived from two existing courses at Partner Institutions.
4) It is the first OERu course that has crowdsourced topics and ideas for the course curriculum.
5) The course will provide options for micro-credentials, including digital badges
6) The course has an "open boundary" format so that full-tuition students on campus at one or more OERu partners can study in parallel with OERu learners on the open web (OERu, 2016g).

During the LiDA meeting, the OERu CEO frequently sought feedback from the attendees. Ahead of time, he had filled a Kanban board with topics to include in the LiDA curriculum. He had asked on the Groups LiDA forum for feedback regarding the course plan, received feedback, and incorporated it into the course plan. During the meeting, he solicited further feedback. The attendees deliberated the points and made changes. The timestamp in the video of the recorded meeting where this action occurred was 28:49. Further time stamps will be provided in parentheses to discuss the LiDA meeting. During the meeting, the OERu CEO solicited feedback twelve times, sometimes by asking individuals for comments or by asking the group as a whole. He asked for feedback regarding the use of a framework for teaching digital literacies and received suggestions about additional frameworks which were added to the meeting minutes (37:42). He also requested feedback after moving Kanban cards (52:00). In ten instances attendees offered feedback, mostly between the 44 and 53 minute marks, to discuss course topics and their placement on the Kanban board.

The OERu CEO additionally used the LiDA meeting as an opportunity to offer professional development. There were 16 instances of the OERu CEO training the meeting attendees either by

explaining or demonstrating a process or offering support to complete a task. One example of a task he offered to help with was to make the course content from one attendee's university openly available. The OERu CEO explained processes such as accreditation, the agile and iterative OERu design process, the use of design blueprints to plan course content, the open assessment options using blogs, and other tools and approaches. One demonstration consisted of showing how to use the Kanban board for storyboarding a course, for categorising content on the board, and for discussing points on the board. Another demonstration aimed to show the use of WikiEducator pages and their accompanying Discussion pages.

The OERu CEO also used the LiDA meeting to reinforce values and remind attendees of the OERu's practices. There were three instances where the OERu CEO described OER-related characteristics such as the power of "open" for re-using and re-mixing OER. Other examples were to highlight the OERu's philosophy of using free and open software and to mention the OERu's agile development process while making changes to the Kanban board (OERu, 2016g, 2016j).

In short, the online LiDA meeting provided an opportunity to showcase the OERu's tools and processes. When the conversation was on the topic of course design and development, it revolved around course structure. Thus, the meeting allowed the ecosystem to evolve by increasing awareness and capacity of technology and processes and to build bridges across the global ecosphere.

Forms and purposes of communication about LiDA during course development

When development of the LiDA course began, anyone could communicate in the Groups.OERu forum (OERu, 2017b) dedicated to that course. It contained updates on planning or course development which often included invitations to correct typographical or content errors. The posts in this forum, the number of contributors replying to the posts, and the frequency of replies are listed and commented in Table 6.1.

Table 6.1. Posts in the LiDA forum and the frequency of replies

Type of post	Date	Number of replying contributors	Number of replies	Comment
Announcement	22 Apr 2016	0	0	
Announcement	29 Apr 2016	0	0	The post was about crowdsourcing. Replies were made in Google Docs, WikiEducator, and Twitter
Post explaining the process of designing the curriculum of LiDA and requesting feedback.	14 May 2016	2	3	
Request for feedback ad request for a specific person to make additions	17 May 2016	0	0	The person who was asked to add content did so.
Announcement	17 May 2016	1	1	The post announced a now-expired doodle poll.
Announcement	22 May 2016	0	0	
Announcement	13 May 2016	2	2	One reply was substantive, offering course content and time for development.
Announcement	4 Jun 2016	0	0	
Announcement	22 Jul 2016	0	0	
Announcement	26 Jul 2016	0	0	
Announcement and request for feedback on course development	18 Jun 2017	2	5	The replies consisted of questions and thank-you messages.
Announcement and request for feedback on course development	11 Jul 2017	2	3	Sharing of a substantial draft document on assessment with a CC-BY license based on the course content
Announcement and request for feedback on course development	24 Jul 2017	0	0	Some changes were made to the wiki pages of the course content in question.
Contribution from someone who frequently replies	30 Jul 2017	1	1	Sharing of the final version of the assessment document.
Announcement about completing a micro-course	30 Jul 2017	1	1	
Announcement about	6 Aug	0	0	Changes were made by a partner to a document presented in the

completing a micro-course	2017			announcement.
Announcement about completing a micro-course	20 Aug 2017	1	1	Substantial feedback was provided.

The OERu CEO used the Groups.OERu platforms to make announcements about the development of LiDA over 16 months. Since the last post about LiDA on August 20th, 2017, the discussion had moved to the platform Community.OERu.org. There was no indication of the move in the Groups forum. Those who were interested or involved in the design of LiDA may have known enough about the OERu to join the Community page without needing such an announcement. However, people who joined after August 20th, 2017 may not have been aware of the link between the Groups and Community pages for LiDA.

These findings indicate that the OERu CEO, as a keystone species in designing and developing LiDA, reached out to the OERu community for feedback on the course. This was consistent with the OERu's practices of open course development and open philanthropy. The responses in the forum were less frequent than in the crowdsourcing activity. These findings indicate that there were challenges in obtaining participation within the OERu network.

Observations of pre-course delivery of LiDA103

The OERu sent emails to students enrolled in their courses prior to the course launch. The purpose of these emails was to prepare students to use the technology in LiDA and provide them with information to support their learning. This practice is consistent with the OERu's use of technology in lieu of tutorial support. I enrolled in the course at the suggestion of the OERu CEO so that I could receive these messages and create accounts for all the social media tools used in the course. Until the end of the chapter, I will only be referring to students - and not learners - for the sake of simplicity, and that the term "learner" may be used in quotes from interviews. My role of researcher remained the same during the pre-course delivery. However, during course delivery, I adopted the additional role of participant-observer/co-facilitator.

Emails about my research on the OERu

On Friday, May 4th, The OERu CEO sent me an email using my student email address and provided a link to LiDA103 (OERu, 2018q). He invited me to visit the landing page (OERu, n. d.-c) to register for the course. I then received an email providing me with an option to register for "Orientation emails", which I selected. The messages I received from the OERu starting on May 4th are shown in Figure 6.5.

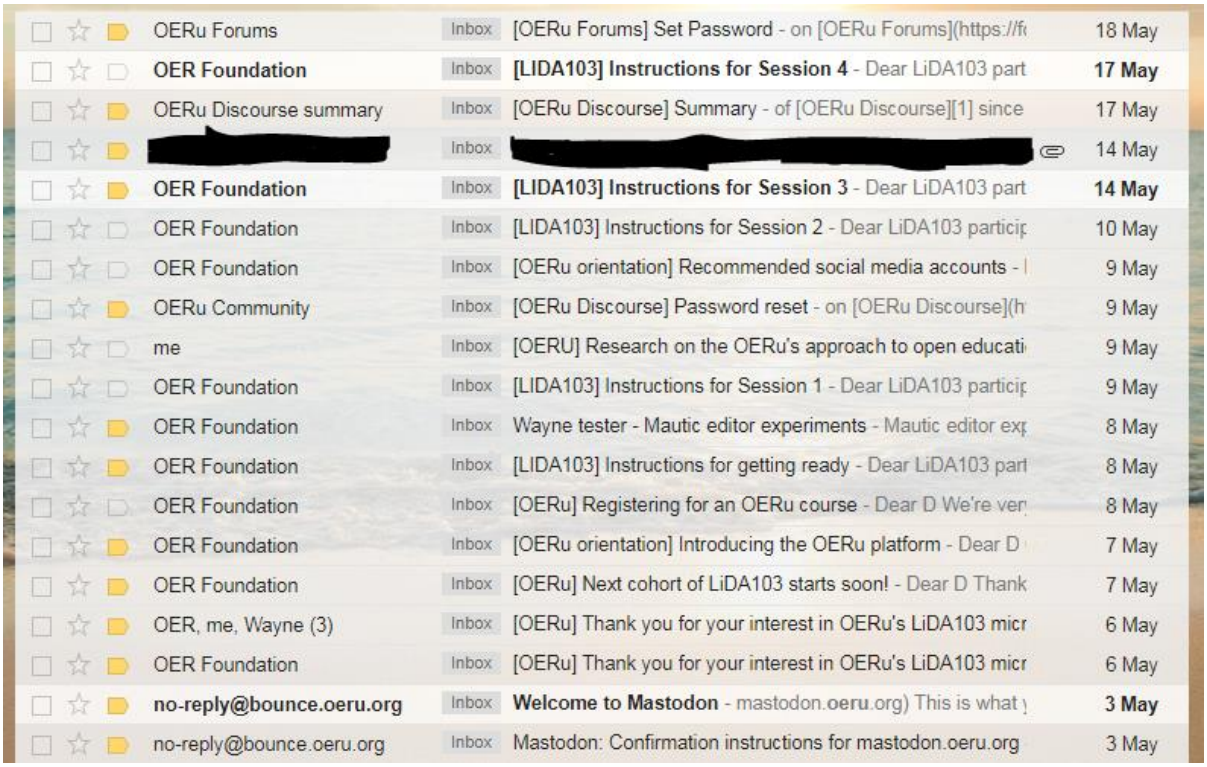

Figure 6.5. Emails received regarding the OERu course. My account has a time zone based in the Eastern Time Zone in Canada. This means that the dates are approximately one day later than in New Zealand. Screen capture taken on May 20th, 2018

The OERu CEO also suggested that I post an introduction on Mastodon.oeru.org and include a link to my blog. In the introduction, I provided more information about my role as a co-facilitator and as an observer in LiDA103 (Figure 6.6.) (Dubien, 2018).

Figure 6.6. My post introducing my work and me to the OERu community. Screen capture taken on May 9th, 2018

I received one message each on May 6th, 7th, and 8th with information about registering for LiDA103, about the types of courses that the OERu offered, and links to OERu.org. There were multiple links to the course site and a link to the support site which contained instructions for creating an account with OERu, registering for an OERu course and logging in to a course site. Links to pages about the OERu platform and social media applications to use in the course were provided as well. Many of the links and much of the content were presented repeatedly in these messages.

I received three orientation emails, one each on what should have been consecutive days from May 7th to May 9th. The one due on the 8th was not received, and I alerted the OERu CEO about it. He corrected it, and I received the missing message on May 24th. The orientation emails described the course platform and how to navigate it (see the welcome page of LiDA103 in Figure 6.7.). They also contained information about the communication tools to use in the course which are part of the NGDLE, their associated tags and passwords, instructions on opening accounts, and activities to practice using some of the tools.

On May 8th, I received an email with instructions for preparing for the course with a welcome message, links to several portions of the course, such as “Start here”, “Establish your personal learning environment”, and “Setting up your personal course blog and declaring yourself”. There were also links to the OERu support site, the FAQ page, the OERu course forums, and promotional information about the OERu’s courses and Edubits credits. I received emails as course announcements marking the start of each learning pathway on May 9th, 10th, 14th, 17th, and 21st. The first message contained a link to the syllabus and a summary of previously received preparatory emails. All of these messages contained links to the OERu support page and to the respective start page of each learning pathway.

Figure 6.7. Front page of LiDA 103. Screen capture taken on May 21st, 2018

The analysis of the pre-course email delivery revealed that the OERu had developed a large volume of content and links to support students in the global ecosphere. The focus was on enabling students to function in the course environment (how to log in, how to navigate the course, how to obtain technical support) and to use open source tools to communicate with other students and form a personal learning environment. These messages were intended to reduce the students' stress and prevent them from leaving the course ecosystem.

Observations of course delivery of LiDA103

For this portion of my study, I adopted the observer/co-facilitator role. Throughout the course, different software applications were used to promote student-student interactions so that they

could support each other. There was the Discourse platform for discussions, hypothes.is, which was an application for social annotation, bookmarks.oeru.org, which used Semantic Scuttle – a social bookmarking tool, Mastodon, which was for microblogging, WENotes (WikiEducator Notes) for comments made within the course platform, and an aggregator of all the posts that contained specific tags mentioned in the course and emails to the students. Students could also use open source blogs such as WordPress, which was used as the course platform, Medium, or Blogger.

Forms of student-student interaction in OERu courses

In some OERu courses, the tools listed above formed the "Next Generation Digital Learning Environment" (NGDLE) mentioned earlier in this thesis. Wayne_CD explained that in OERu courses, students were invited to create accounts in blogs for social interaction and for retaining course content after the course was completed. This means that learners had control over everything they produced. In LiDA103, there were five activities inviting students to write blog posts. Unfortunately, I could not gain access to the students' blogs for reasons explained by the OERu CEO in an email:

> We are in the process of re-configuring the blog url registration process to automate finding the blog feed url. We noticed from an earlier [micro-course of Course A] that most learners did no [sic] know what their blog feed url was. As an interim measure - learners typically post the url via a mastodon toot with the course hashtag - but I hvan't [sic] noticed any blog post mention" (W. Mackintosh, personal communication, May 11th, 2018).

OERu courses also contained opportunities for micro-blogging, which Wayne_CD suggested could be used in the same way students in an on-site course would discuss their work at a café. Wayne_CD explained the rate of use of micro-blogs:

> We typically find that on average, it varies from discipline to discipline, a quarter of the site visits, in other words, learners who identify themselves through password registration and those that don't, roughly 25-30% engage in micro-blog conversations which is quite interesting. What we also know is that almost all learners that engage in the courses read and monitor what the learners are saying.

This quote is significant in indicating that a low frequency of posts was to be expected in this course.

Observations of student interactions

As mentioned earlier, I had written a post in Mastodon to introduce myself and explain my roles in LiDA and that I could offer assistance to the students regarding content. Each day, in the morning and evening, I verified the course feed for responses, but no one asked me for help. So I contacted the OERu CEO on May 16th, 2018 and indicated that I hesitated to make unsolicited posts in the course given my role as a researcher.

His response with regards to my hesitation to post in the course was,

> Researchers have opinions ;-) - so don't feel that you can't share your own thoughts and ideas. Please feel free to post your own thoughts on any of the forum questions or replies to learner posts. In fact, this would be an extremely valuable contribution to OERu. We use the first cohort instance to "populate" the forum sites so they don't look like ghost towns when self-study learners join the course in the future.

Thus, I searched through the course feed to find a recent post that I could respond to and found one in the forum entitled “Copyright and ownership of learner generated ideas.” I responded to the student’s post and ended with a question but received no response.

There were three activities for annotations and the only annotation was made by the OERu CEO. An example of annotations being tracked in LiDA103 using hypothes.is is shown in Figure 6.8.

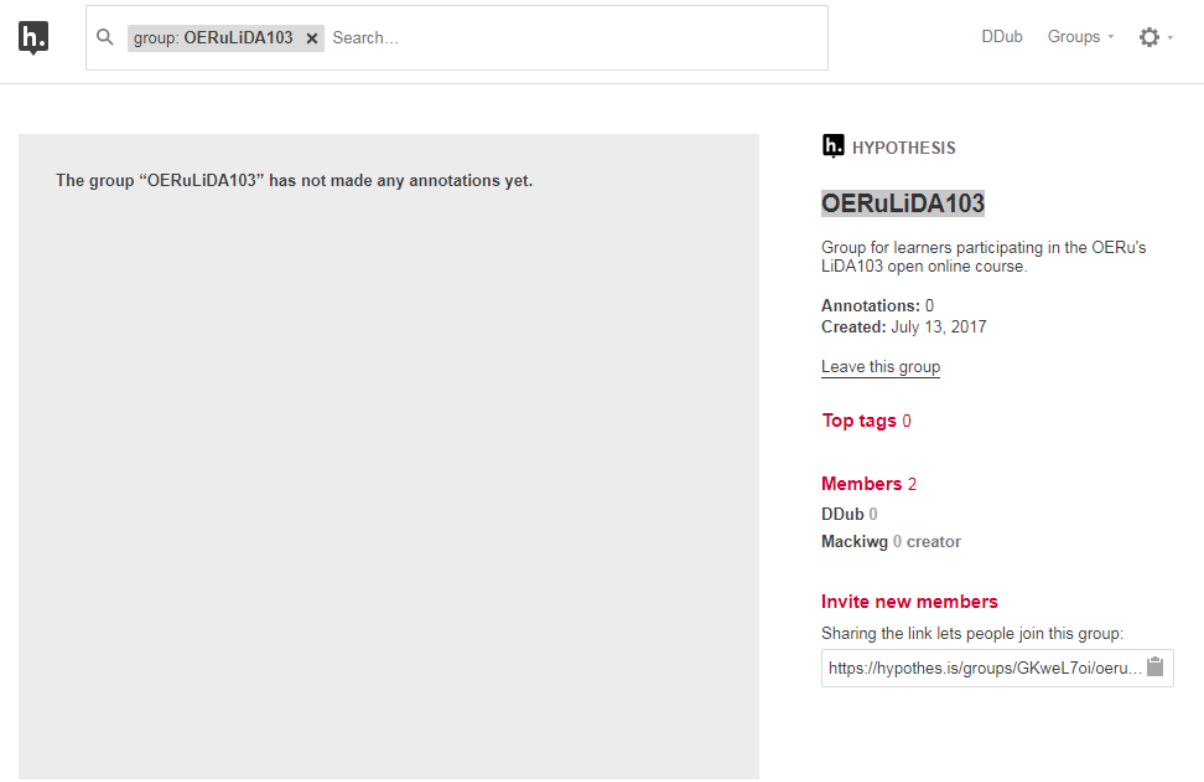

Figure 6.8. This image shows the space where students can share bookmarks with each other (hypothes.is, n. d.). Screen capture taken on June 3rd, 2018.

There was one bookmark for LiDA 103 provided by the OERu CEO. The online space for sharing bookmarks is shown in Figure 6.9.

Figure 6.9. The OERu bookmarks page for LiDA 103 (OERu, n. d.-d). Screen capture taken on June 3rd, 2018.

In LiDA103, there were 17 activities using micro-blogs. The posts written in Mastodon were called "toots". In a toot, a user could insert a photo or a content warning (e.g., spoiler). It also allowed the user to select the audience of the toot: Public, unlisted (not posted publicly), Followers-only, and Direct (posted only to mentioned users). Users could write up to 500 characters and insert a wide selection of emojis. The toots were published in a feed called "Home". My Mastodon account is shown in Figure 6.10., and a close-up of my personal feed is shown in Figure 6.11. The posts using the #LiDA103 Hashtag from May 9th to May 23rd included:

- 4 toots by four people introducing themselves or to write a "test" toot.
- 8 Toots by the OERu CEO sharing news about CC, greeting students who are "tooting" on Mastodon, explaining how Mastodon works, promoting openness by encouraging a student to publish a presentation on OER openly
- One toot by me to introduce myself

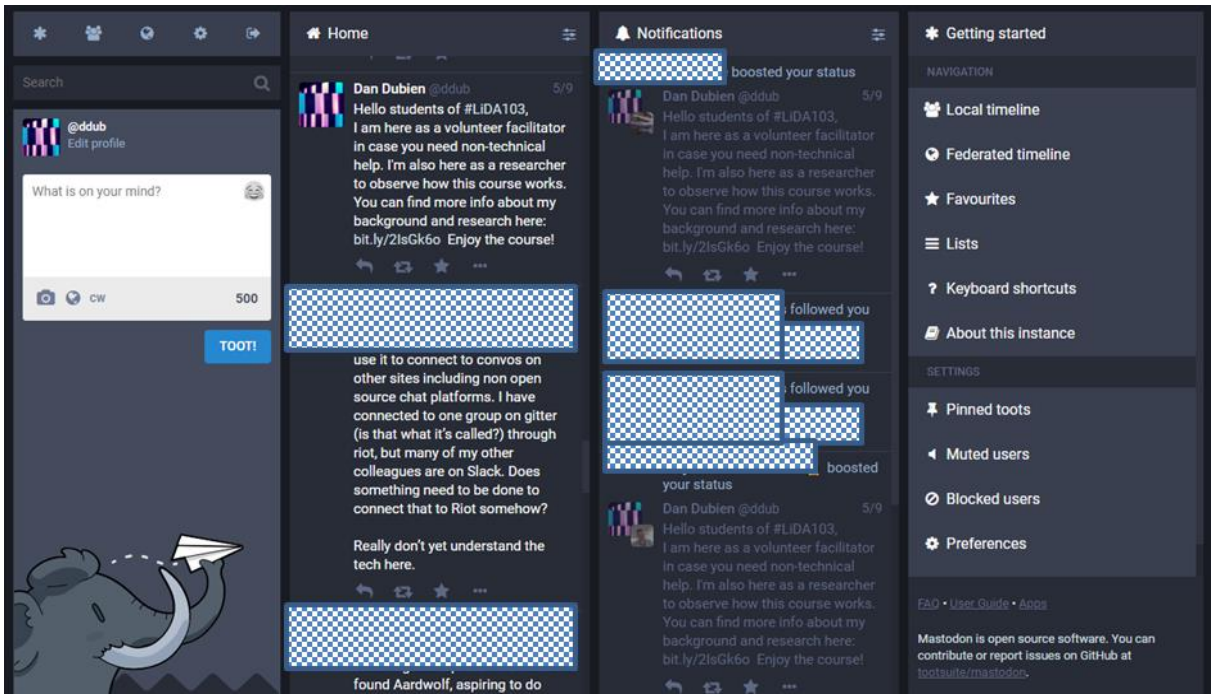

Figure 6.10. My Mastodon page (some sections have been covered up for confidentiality). Screen capture taken on May 10th, 2018.

Figure 6.11. Notifications in my Mastodon feed (some sections have been masked for confidentiality). Screen capture taken on May 10th, 2018.

In LiDA103, the students were frequently asked to answer the questions in a discussion forum (https://forums.oeru.org/t/lida103-general-forum-for-open-education-copyright-and-open-licensing/325) shown in Figure 6.12., where information that identified users was concealed using blue boxes. The first post in any forum of LiDA103 provided instructions, and the remaining posts were replies. There was a forum for general discussion about LiDA103 (https://forums.oeru.org/t/lida103-general-forum-for-open-education-copyright-and-open-licensing/325) where there were no posts by students. There were four other discussion forums:

- *Why open matters for learning in a digital age* (https://forums.oeru.org/t/lida103-why-open-matters-for-learning-in-a-digital-age/327/10)
- *Definition of OER* (https://forums.oeru.org/t/lida103-definition-of-oer/328)
- *Solving real-world problems with OER* (https://forums.oeru.org/t/lida103-solving-real-world-problems-with-oer/330)
- *Copyright and ownership of learner generated ideas* (https://forums.oeru.org/t/lida103-copyright-and-ownership-of-learner-generated-ideas/326)

With respect to these four discussion forums, here is a breakdown of the replies:

- 5 replies by students, 4 replies by the OERu CEO on the topic at hand
- No replies in the "Definition of OER" forum
- 3 replies by students, two replies by the OERu CEO
- 1 reply by a student, one reply by the OERu CEO, one reply from me

In all of these discussion forums, no student replied to any other student. In the "Why open matters…" forum, one student replied to the OERu CEO.

One forum was used as a poll containing two questions about use of OER and textbooks, with 8 responses each, one response being mine. One person posted a reply in this forum (https://forums.oeru.org/t/lida103-spot-poll-learner-experience-with-oer/329). On the page listing the LiDA103 forums, the number of "views" per forum was indicated. They ranged from 331 to 434. Generally, the forums with more posts were the ones with more views.

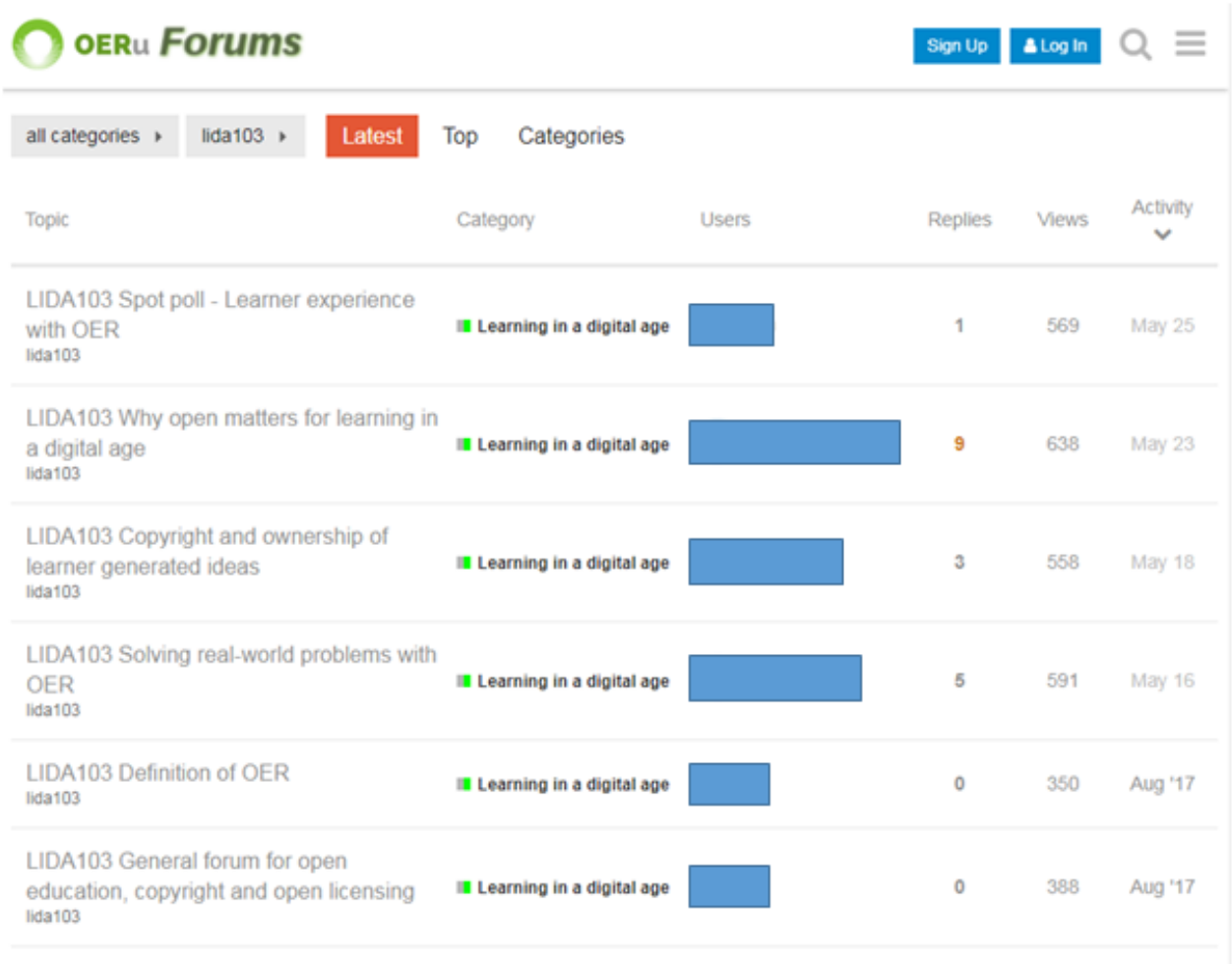

Figure 6.12. LiDA103 Discussion Forum topics (OERu, n. d.-e). Screen capture taken on July 24th, 2018.

The course feed revealed posts from the NGDLE arriving in chronological order in a fashion similar to that which Wanda had described observing in her course.

The examination of student interactions using the OERu's NGDLE showed low interaction among students in the course ecosystem, and low participation was expected since Wayne_CD had explained that the majority of students in OERu courses do not post content, but most read that which is available. Social annotation and bookmarking were not used, while micro-blogging was used for student introductions and for the OERu CEO to guide students in using the open source technologies. Interactions based on course content occurred in the discussion forums, though there was no student-students interaction, but rather much student-facilitator interaction with the OERu

CEO. As the keystone species in this course ecosystem, the OERu CEO was active in the micro-blogging and forum environments.

6.3. OERu's stressors

To this point, the case of the OERu has been examined in detail, beginning in Chapter 5 with its organizational structure, its ideology, and its open communication and open philanthropy. In this chapter, we've explored characteristics of the OERu's courses, pedagogy as viewed by the OERu and some of its individual members as well as the processes of open design, development and delivery of a course. Throughout this case, a variety of stressors influenced how these resources and processes were used. They affected interactions within the ecosystem. They rendered some processes more sustainable and others less so, while the OERu attempted to evolve towards making OER a part of mainstream tertiary education. To gain an understanding of these stressors is to be better prepared for adopting and adapting processes modeled by the OERu. The intended result is that tertiary institutions interested in engaging with OER and OEP might do so more successfully.

In this analysis, the term "stressors" is preferred over "barriers" and "enablers" which are typically used in the literature on the topic of OER engagement (e.g., Cox and Trotter 2017a, 2017b,; Rolfe, 2012). The term "barrier" refers to any issue or procedure that impedes development of OERs. Enablers are any action, process, or attitude that facilitates the development or encourages the use of OER for the OERu. In short, barriers and enablers are, respectively, actions that promote or inhibit or promote the progress of open education projects. Note that sometimes an item has characteristics of both an enabler and an inhibitor. One of Trevor's comments caused me to rethink the terms "barrier" and "enabler":

> Weirdly enough, I think a barrier and an enabler might be one and the same thing. I don't think sometimes people realize how easy it can be to get started [on open education projects]. You could go to Reclaim Hosting and start up a WordPress multi-site for $10 a month and run a pretty sophisticated open, online technology framework and there's so much OER out there, you could ramp things up really quickly. I think sometimes that enabler - the relative low cost to entry - can also in a weird way create a barrier because it - I think, for a lot of people - undermines credibility.

This view parallels that of the Arena framework whereby barriers and enablers are called “stressors” since they can influence open education innovations in positive, negative, or both ways depending on the circumstances, resources, and people involved. Thus the terms “barrier” and “enabler” will be relabeled as stressors, which is a more encompassing term referring to a force that motivates species to change their behavior. Despite this point, the stressors examined in this chapter and chapter 7 will be also be identified as a barrier or enabler based on their dominant influence on OER engagement. Further, they will be organized according to Cox and Trotter’s (2017b) OER adoption pyramid. Some of the barriers and enablers are not strictly about OER and will be identified with an asterisk. The categories in the Pyramid, in order from those that are more externally determined to those that are more internally determined, are: Access, Permission, Awareness, Capacity, Availability, and Volition.

Within each category, the stressors will be examined individually as in a discussion. The same will be done in section 7.3 for the PIs’ stressors. The stressors will be analyzed and discussed in an overarching fashion in the main thesis discussion in section 8.1. The discussion about each category will begin with a description of the control that faculty have over how they engage with OER. The discussion includes an analysis using Davis’ (2018) Arena, which is why I have maintained the use of ecology-based terminology. The discussion about each stressor ends by indicating the location of that stressor on Figure 6.13. according to alphanumerical labels. This diagram is the result of combining analyses using Cox and Trotter’s (2017b) and Davis’ (2018) frameworks.

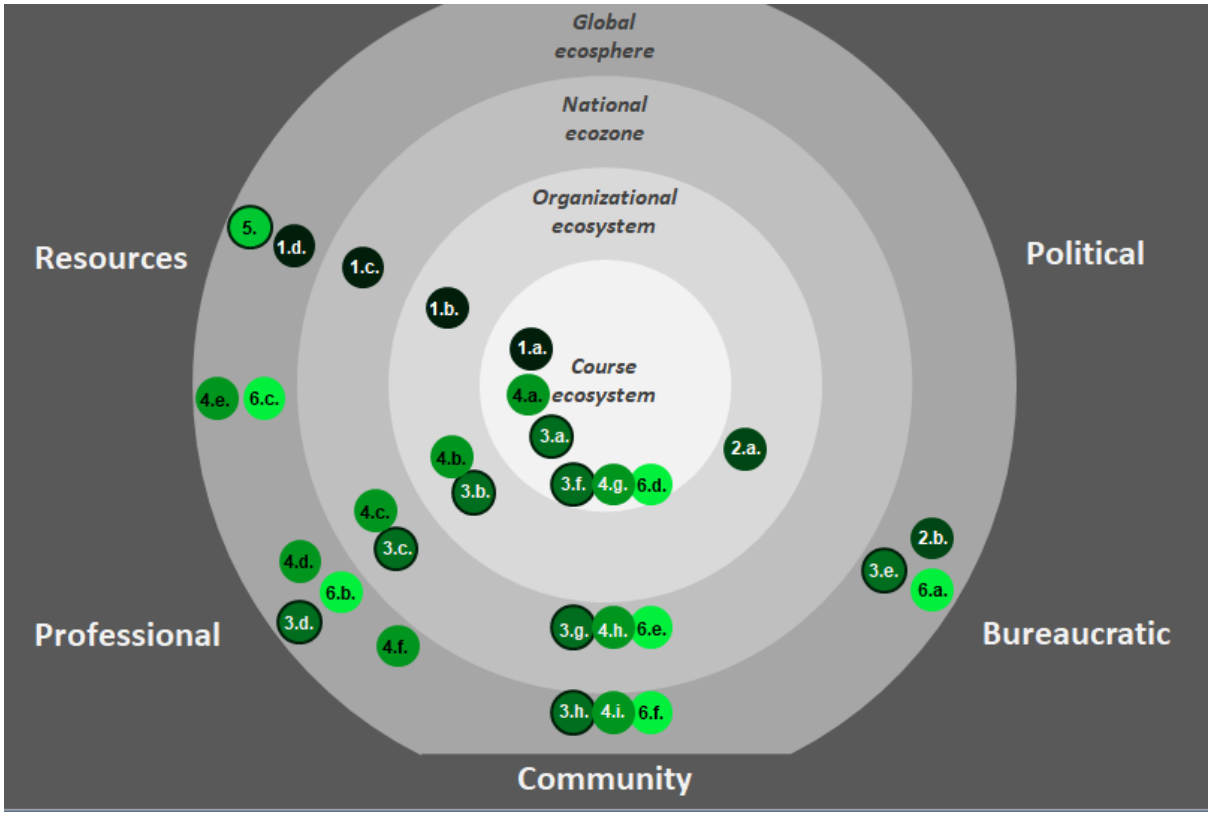

Figure 6.13. Arena displaying the locations of the stressors related to course development by the OERu.

The OER adoption pyramid: Access.

Stressor 6.1.* Enabler: Provision of access to OERu infrastructure

Cox and Trotter (2017b) indicate that access to infrastructure is the category of their framework where staff have no control. There were no issues related to access that were brought up in the case of the OERu. This is likely because access is not a concern for the OERu, as it is in a developed city. Given that the OERu has an open source technician whose role it is to build infrastructure to provide anyone with internet access to its resources, it is considered an enabler. In Figure 6.13., this stressor is located at positions 1.a., 1.b., 1.c., and 1.d.

The OER adoption pyramid: Permission

Stressor 6.2. Enabler: Permission granted or not by a PI to a course developer to openly license a course

Cox and Trotter (2017b) indicate that staff have very little control over the intellectual property policies at their institutions. At the OERu, the default is to openly license courses, and the course

developers are recognized on the OERu's individual course page. In Figure 6.13., this stressor is located at position 2.a.

Stressor 6.3.* Enabler: Permission granted or not to OERu to use courses

When PIs share courses, the OERu acknowledges the institutions and individual staff members as the developers (OERu, n.d.-b), and sometimes, the institution alone (OERu, n.d.-a). Bureaucratic decisions regarding Permission may affect the OERu's ability to use a given course. At IIIU and EEEU, the course developers were acknowledged as the creators, not the institutions. That is why this stressor is labelled as an enabler. In Figure 6.13., this stressor is located at position 2.b.

The OER adoption pyramid: Awareness

Stressor 6.4. Barrier: A lack of awareness and understanding of OER

Rory said that he believed that a lack of awareness was the greatest barrier to OER adoption and creation. He also recognized barriers such as a lack of time and prioritization of other work over OER. This lack of awareness could put pressure on the keystone species at each PI to champion OERs and the OERu. It also could add stress to the OERu CEO and the Open Source Technician to provide energy (technical support and professional development) to staff at the PIs. This support is enhanced when species from a partner institution have experience working with the OERu and developing OER such that they can act as a bridge between the OERu and the PI. All participants apart from Wayne were such bridges. As awareness of OER slowly spreads, and knowledge of OER development increases, the stresses mentioned above can be reduced, rendering OER development teams and their projects more sustainable. In Figure 6.13., this stressor is located at positions 3.a., 3.b., 3.c., and 3.d. This means that all of the ecosystems are at play. An interpretation is that course developers interested in using OER may not understand where in the global ecosphere and the national ecozone to find OER, that OER can have different cultural contexts, how OER can be of use in the organizational ecosystem, or how to use OER in the course ecosystem.

Stressor 6.5. Enabler: Learning about the benefits of Free Cultural Works

An enabler for OER development was the allowance (energy) of Free Cultural Works to be remixed and redistributed. Wayne_AD elaborated on this point:

> If you go to freedomdefined.org you'll find the details around this, but one of the other requirements of Free Cultural Works licenses is not only the legal permissions that are given through the open licensing, but also a requirement for open file formats, and the ability to run courses using free and open source software. We have a fundamental belief that no learner should be denied access to learning for lack of funds to legally purchase a software license or to be tempted to use software illegally. All our courses will be able to run entirely using free and open source software.

Indeed, Wayne_AD explained that all works produced by the OERu had to be Free Cultural Works. He further explained that this approach avoided risks related to commercial issues since Free Cultural Works exclude resources with a non-commercial license. For example, if an OERu course carried a non-commercial license, the creator of the content could consider that charging fees for assessment is a commercial activity. While this approach did protect the OERu, it may not have been necessary. Publicly funded universities can use OER with non-commercial licenses in their courses and textbooks since they are not considered to be commercial entities (personal communication with a university librarian, Nov 19th, 2019). While this point is controversial, it does indicate that the OERu may have been limiting the pool of OER that it borrowed from to create its courses. In Figure 6.13., this stressor is located at positions 3.d.

Stressor 6.6.* Barrier: Misconceptions inhibiting participation in the OERu and engagement with OEP

Another barrier described by the OERu CEO was mentioned by a prospective partner at a private institution who said that he was hesitant to join the OERu because his institution did not receive public funding for such projects. Wayne_AD responded that publicly funded institutions didn't receive such funding either. Thus, public and private institutions are generally on the same footing when it comes to funding open education projects. There is an exception that the OERu CEO may not have been aware of: Rory McGreal's tertiary institution received $2 million CAD from the provincial government to develop OER, and Rory was the co-chair of the initiative. The OERu did have an approach for informing potential partners about the benefits of joining the network to avoid

misconceptions that would inhibit them from joining. The attendees of the 2018 International Partners meeting of 2018 suggested that the OERu clarify the benefits for prospective partners in the letter of invitation it used for recruitment (OERu, 2018f). In Figure 6.13., this stressor is located at position 3.e.

Another misconception relates to language. Wayne_AD explained that the term "open educational practices" was sometimes perceived as a novel concept completely different from more familiar online practices. These perceptions were sometimes held by people who were implementing forms of OEP but did not refer to them as such. Thus, different understandings of OEP based on language created a barrier to awareness about OEP. In Figure 6.13., this stressor is located at position 3.e.

Stressor 6.7.* Barrier and Enabler: Navigation and consultation of OERu's open documents

Wayne_AD explained that some OERu partners struggled with learning how the OERu functioned and often requested information about the OERu model. This was a demand on the flow of energy from the CEO. This stressor had the potential to be at least partially alleviated by the OERu's open distribution of planning documents. However, there are issues with navigating the platforms containing those documents. For example, there were two working groups called the *Course approval and quality working group* and the *Curriculum and programme of study group*. They were merged to form the *Curriculum, programme of study and quality group* (OERu, 2016ab). The meetings of both original working groups were posted on that page. However, the minutes of a meeting of the merged group were posted in a Groups forum (OERu, 2015i). Perhaps the relevant members were contacted in such a way that they would know where to find the agenda, online meeting location, and minutes. The agenda was posted on the day previous to the meeting, and this post was the first to that particular discussion forum. This evidence suggests that the relevant members were contacted by means other than the OERu's open channels so that they could learn about the meeting and the agenda in time to attend. This meeting was the last for the merged group. Later, a new working group focused on a similar topic (development of a quality assurance

framework for the OERu's courses) was formed. The last post in this forum was about the new group's minutes of their first meeting. All subsequent communication occurred in the Community forum (OERu, 2018l). There was also a WikiEducator planning page for the new group (OERu, 2018k). On this page, it was indicated that the tag to use to find discussions about its work in the Community forums was "Quality group". This was the tag that the group used originally, but it was later changed to "Curriculum and quality group". This example of the evolution of a working group indicates that there is indeed a great amount of information available on its progress. Yet another point is that, even though several working groups were listed on the OERu's WikiEducator Planning page – including the Curriculum, programme of study and quality – the page of that working group did not lead or link to the most recent version of this group: Quality Review Project pages (OERu, 2016t, 2016ab). These findings show that, while there was a great deal of information regarding OERu's activities available, there were challenges in locating relevant details. The high volume and number of locations of planning documents and discussion forums, both current and inactive, can be a stressor for anyone who is new to the OERu and its processes. In Figure 6.13., this stressor is located at position 3.e.

Stressor 6.8. Barrier: Lack of access to OER due to organizational issues

A barrier that Rory mentioned was that there were OERs on his institution's website that were not being used as courses and vice-versa. Also, not all of BCcampus' open textbooks could be used at his institution because they did not conform to the course requirements. However, textbooks produced by Rory's institution were found on BCcampus' site. This stressor could be due to communication issues. Rory's hope was that a keystone species of his institution (the next president of his institution) would resolve such issues. In Figure 6.13., this stressor is located at position 3.e.

Stressor 6.9. Enabler: Students' awareness of OER

When students discover OER, they tend to support them because of the cost benefits, as Rory indicated. In Figure 6.13., this stressor is at 3.f. for any student in the course ecosystem, whether for

credit or not. It is located at positions 3.g. and 3.h. for international and NZ-based students respectively, and not enrolled in any capacity in a course.

The OER adoption pyramid: Capacity

Once course developers are aware of OER, the next step towards full OER engagement is developing skills required to find, adapt, combine, evaluate, license, and share OER. It is within their control to determine the required skills and to develop them, as indicated by Cox and Trotter (2017a) who acknowledge that this process takes time.

Stressor 6.10. Enabler: Spread of professional knowledge and skills

The capacity to learn new pedagogical ways of using open source technology increased for the OERu CEO when he observed how they were used in micro-courses by students, or how they were managed in lessons by co-facilitators like Wanda. Any course delivered through the OERu was an opportunity to learn more about technology and pedagogy. In Figure 6.13., this stressor is located at position 4.a. when a course developer is delivering a course and 4.d. when not in a course.

Knowledge within the organizational ecosystem increased whenever the OERu employees learned more about technology, pedagogy, or openness. Examples are skills development when building up the OERu's infrastructure or when they learn about pedagogical approaches that they advance as an organization, such as the pedagogy of discovery. In Figure 6.13., this stressor is located at position 4.b.

According to Wayne_CD, people learned about OER development (increase energy) by doing course development and through a form of apprenticeship, with the guidance of more experienced OER developers. Wayne_CD explained that as the OERu community developed, more members could train others. The OERu network as an ecosystem could become more sustainable if more individuals possessing these skills and knowledge stayed in the system, and spread their knowledge (increase energy). In the case of IIIU, Stephen was in a role that allowed him to train staff and assign tasks; he

was able to make course development and other OERu tasks sustainable. In the contrasting case of EEEU, John_CD reported that many people in the role of course developer left his institution. The result was devolution of the course ecosystem and of the organizational ecosystem with regards to course development for the OERu. There was also a loss of invested energy and disruption to the system with regards to future development of OERu courses. John has since been a part of another project for developing a course for OERu, but that project had not yet reached the stage of development where John's experience in OER development would be useful. In Figure 6.13., this stressor is located at position 4.c. for PIs located in NZ, and 4.d. for those abroad.

Stressor 6.11. Barrier: Lack of energy (time, funds, resources)

Wayne_AD believed that faculty had time to develop courses based on OER, even though a lack of time to do so is often cited as a barrier (e.g., McKerlich et al., 2013; Rodés, 2019). He reasoned that OER development could be made a part of the usual course-development process. This approach would not take extra time than with traditional course development processes (Wayne_AD). This finding reveals a viewpoint held by someone who has worked both in a variety of tertiary education settings. Some faculty and course development staff, such as Stephen_CD and Samantha, had the knowledge and skills to rapidly take on OER development and make it a part of their usual processes. However, some course developers, such as John and his colleagues, required more time and support (energy). In both vignettes in Chapter 7, interviewees revealed that there was a significant learning curve in determining how to code in WikiEducator, how to use and adapt OER, and how to use CC licenses. Otto (2019) highlighted that legal aspects related to understanding of OER licenses was of particular concern.

John added that lecturers may have been used to developing courses in a particular platform or modality, and they may not have wanted to learn to use a different one, which could disrupt the ecosystem. For context, John_CD and his colleagues used Moodle. Even though content could be pulled from WikiEducator into the Moodle platform, John_CD indicated that faculty preferred to

develop content in Moodle. One solution to this problem was presented in the vignette of IIIU. It showed that stress was lower when technological tasks such as development in WikiEducator were assigned to people in technological roles. Indeed, in his institution, technological developers welcomed a new way of coding, since it made their work more interesting.

Similarly, course development work such as finding OERs and using CC licenses correctly was less of a challenge for full-time instructional designers like Stephen_CD and Samantha than it was for someone whose main role was not in instructional design, like Wanda. Further, Nascimbeni, Burgos, Campbell, and Tabacco (2018) found that the amount of implementation of OEP varied with the roles in a tertiary education institution. They found that professors opened up their design processes more than researchers. They also suggested that researchers – particularly early-career researchers – may have less time, confidence, and energy to innovate with open education. Therefore, the solution of integrating OER-based development into regular course development processes may not be a simple solution.

It appears that assigning particular course design and development tasks to species with corresponding roles can lead to more effective course development and a lower amount of stress in the system. The OERu CEO and John explained that the OERu provided support through an instant messaging chat channel, and this action can further reduce stress. In Figure 6.13., this stressor is located at position 4.a.

Stressor 6.12.* Enabler: Openness of OERu planning documents and communication channels

The OERu's platforms containing its planning documents and courses were designed as enablers of OER engagement; they provided stress as a stimulus by building awareness of OER, providing a low-risk space for experimentation and innovation, and offering a place to practice working in open spaces (Wayne_AD). Another aspect of the OERu's infrastructure was the variety of communication

tools: email lists, real-time chat, forums, groups, OERu Google group, etc. Wayne_CD believed that the OERu's openness offered the potential for professional development. It also allowed people to see past discussions. As explained by Wayne_CD,

> We use an open technology called Groups. All the discussions persist which means anybody can go back and see decisions that were taken previously. That makes it a lot easier for us to bring new participants up to speed. We just have to point to earlier decisions and discussions that were taken.

In Figure 6.13., this stressor is located at position 4.e.

Stressor 6.13. Enabler: Open courses developed by the OERu on the topic of the design of OERs

The OERu has developed courses (matter) about course design for open environments, and Wayne_AD thought they could be a cost-effective measure for professional development. The courses were:

- Digital skills for collaborative OER development (OERu, 2016c)
- Open content licensing for educators (OERu, n. d.-g)
- Curriculum design for open education (Bossu & Fountain, n. d.-b)

However, he indicated that this type of training was not a priority for the OERu and that he would not place these courses among the OERu's advertised offerings to the global ecosystem because they were intended for a future program launch. Rory presented another reason why these courses should not be a priority: most faculty would not be motivated to take courses in instructional design. When asked what kind of resources or training would be required to facilitate the development of OERs by faculty, Rory responded that instructional design training would be beneficial, but that there was a lack of motivation for such training. He presented an alternative: having faculty work alongside instructional designers. His university hired such personnel. He recognized that his university was in a good position since it had the resources required to build OER-based courses whereas many other universities didn't. He also thought that faculty would adopt OER more if they consisted of the "full package" including assessments, quizzes, interactive media, where the

instructor had only to deliver the content. Stephen made a similar statement. Both agreed that there are not many OER that contain all of these resources. In Figure 6.13., this stressor is located at position 4.e.

Stressor 6.14.* Enabler: Use of open source technology

An enabler described by Wayne_AD was that the OERu used only open source technology and open file formats. The rationale was that learners should not have to pay for or illegally download licensed software. Additionally, Wayne_AD expressed the importance of building a sustainable and low-cost (low-energy expenditure) solution for the provision of tertiary education. Similarly, for Rory, the ability to remix materials was more important than the OER being free of charge. These findings show the values of people who had long experience with OER and open source technology. In Figure 6.13., this stressor is located at position 4.e.

Stressor 6.15.* Enabler: AVI (concept)

Wayne_CD described Academic Volunteers International, a concept whereby species in the Community sector, such as retired professors, currently working educators, senior students, etc. could support students taking OERu courses. It was suggested that students acting as AVI could be given credit for community service. Wayne_CD hoped that this concept could transition into a reality. A potential obstacle for the volunteers is that they might not understand how to make the most of the courses and their associated technologies. Additionally, to fully involve themselves in the OERu courses and provide learners informed advice about how to succeed, the volunteers would likely be required to create accounts and learn to use the tools mentioned in the previous point.

The most recent International Partners meeting where the AVI was mentioned was in 2017. It was suggested that the OERu work with Peer-to-Peer University, a separate open and online course provider that had a tertiary education ecosystem community in the global ecosphere. Other suggestions were to examine the option to provide support on a paid basis, to research the kind of student support services that would be required, and to determine what the OERu could offer.

These points were accepted among others as OERu Strategic priorities for the OERF. John_AD and Stephen_AD explained that it was not clear how to build a business model based on such services. This issue relates to the bureaucratic sector and highlights the financial risk of innovations. In Figure 6.13., this stressor is located at position 4.f.

Stressor 6.16.* Barrier: Target learners' capacity to study in the OERu's courses without tutorial support

John_CD raised the point that the OERu's target audience of students excluded from the tertiary system may not have possessed sufficient skills to complete the OERu's courses because of technological aspects (i.e., having to create accounts to interact with others). In Figure 6.13., this stressor is at 4.g. for any student in the course ecosystem, whether for credit or not. It is located at positions 4.h. and 4.i. for international and NZ-based students respectively, and who are not enrolled in any capacity in a course.

Stressor 6.17. Enabler: Building learners' capacity through LiDA

The Learning in a Digital Age course was designed specifically to help students new to online learning to learn about technologies for communicating online, to practice networked learning in an open environment, and to learn about Creative Commons licensing, among other topics. In Figure 6.13., this stressor is at 4.g. for any student in the course ecosystem, whether for credit or not. It is located at positions 4.h. and 4.i. for international and NZ-based students respectively, and who are not enrolled in any capacity in a course.

The OER adoption pyramid: Availability

University staff species who are allowed to openly license their courses are in full control as to whether to make them available or not (Cox & Trotter, 2017b). Some faculty feel that some course content requires interactions between the instructor and the students, and so do not make their content available online. At some institutions, faculty are given full control over the quality assurance process, making them a keystone species as an overseer of course production (Cox &

Trotter, 2017b). As for university staff who are not allowed to openly license their courses, they only have control in borrowing OER or suggesting that their students borrow particular OER.

Stressor 6.18.* Enabler: Availability of open source technology

With the OERu's reliance on open source software, their ecosystem's technological evolution depended in part on finding suitable programs to use and adapt for infrastructure, communication, or learning. For example, the OERu did not develop programs for offering micro-credentials. Instead, they waited for someone else to develop them, as Wayne_AD indicated. Eventually, EduBits were developed, and the OERu adopted them as badges for their micro-courses. In Figure 6.13., this stressor is located at position 5.

Cox and Trotter (2017a) found issues related to the availability of OER as learning materials. They interviewed lecturers, one of whom thought that it would take a great amount of time to make his course available as an OER. He felt that he would need to remove contextualizing content so that it could be more generic. He also felt that to "package it for [the public] … with a shell and all the connections that would make it generic would take 10 times the amount of time" (Cox & Trotter, 2017a, p. 316). Indeed, context is valued, since OER engagement tends to increase when borrowers perceive OER as fitting into the context of their work (Hood & Littlejohn, 2017).

There were other lecturers who had concerns about the quality of their courses, and so would not want to make them publicly available. An issue in this case is that the course quality was only of concern if it were made public, so that the lecturer's reputation would have been at stake. This finding suggests that the lecturers did not subject their course work to quality assurance processes for regular teaching purposes. If this is true, the concern lies in the process for assuring course quality. Other lecturers interviewed by Cox and Trotter were confident with sharing their materials openly. These points are especially valuable for the OERu to consider addressing while it tries to build its culture of sharing. People in different cultures and situations face different stressors that

can either propel them towards or away from a culture of sharing. If these points can be addressed, then it will facilitate the evolution towards a culture of sharing.

The OER adoption pyramid: Volition

If all the factors in the previous categories are present, then the only factor remaining that affects whether or not a species will use OER is the desire to do so (Cox & Trotter, 2017b). This desire can be shaped by "personal values of the individual educators, the institutional support mechanisms (financial, technical or policy-based) that may or not be present, and the social norms and expectations of the departments and disciplines they work in" (Cox & Trotter, 2017b, p. 161). An example of institutional volition is UNISA which has no policy to support OER. Regardless, UNISA has created a role for OER management, offered workshop training on OER, and has signed the Paris OER and Berlin Open Access declarations. Thus, volition to engage with OER can take different forms and can evolve with time and an increase in understanding.

Stressor 6.19. Barrier: Administrative issues

Organizational barriers such as administrative issues can impede OERu partners from developing courses as OER, as Wayne_AD acknowledged. This is why the OERu worked within its partners' existing policy. He believed that the real barriers were found in the culture: they were related to a preference for proprietary materials and a fear that using an open model will result in decreasing student enrollments. According to Wayne_AD, there was no evidence supporting this fear. He added that he did not believe that policy results in a change in use of OER. He believed that administrators make policy changes that were supported by faculty and staff in order to retain authority and power. These findings suggest that in the best of situations, OER development could be integrated into usual course development processes.

The practice of working within an institution's existing policies may have supported some practices. However, as Coughlan et al. (2019) indicate, there were a range of practices involving OER:

> The use of OER typically involves changes in practise. These may be relatively minor (e.g., finding and selecting OER for use in teaching but not changing anything else) or

> more far-reaching (advocating OER and engaging in more sophisticated remix and reuse behaviors) (p. 172).

The more complex practices - and some even more involved than those suggested by Coughlan et al. - could require support in the form of a policy. Cronin (2017) took a stronger position by indicating that in an institution where openness was not a part of the culture, "the absence of open education policy acts as a constraint to OER awareness and use" (p. 28). Cronin also recommended that such policies be informed by research that includes staff and students as participants and examines their views, experiences, and issues regarding open education. If an institution was interested in changing its policies to support OER engagement, it was recommended that policy makers obtain or conduct

> good research on successful (and unsuccessful) policy implementations in order to assess the effectiveness of different OER projects and to discover gaps between policy and practice. Critical determinants of success — such as sharing, funding, capacity building, and regulation setting — should be addressed through relevant policies. These should include incentives, monitoring and assessment mechanisms (Rory McGreal, Miao, & Mishra, 2016, p. 4).

This advice is valuable, and similar to the skills and knowledge required by faculty to use and create OER, needs to be spread among policy makers.

One interviewee in Cox and Trotter's (2017a) study agreed with these positions. This person felt that a policy promoting engagement with OER would make the institution more accountable and increase the likelihood that funding and resources would be provided (Cox & Trotter, 2017a). However, another interviewee felt that lecturers would engage with OER with or without policy to this effect, and that individuals' values were a better indicator (than pro-OER policy) of whether or not they would engage with OER. Yet another view was that there needed to be a combination of top-down policy and bottom-up activity among staff so that engagement with OER and OEP could be successful and sustainable (MacKinnon, Pasfield-Neofitou, Manns, & Grant, 2016). Kaatrakoski et al. (2017) add that there was more likely to be a misalignment between faculty needs and the structure, policies, and practice imposed by executives if the two were too separate from each

other. Thus, these authors supported a bottom-up approach to facilitate engagement with OEP. In Figure 6.13., this stressor is located at position 6.a.

Stressor 6.20. Enabler: Financial incentives

Some OER proponents suggested that financial incentives could enable OER development (Cox and Trotter, 2017a; Rolfe, 2012). At John_CD's institution, funds were provided for open education projects. However, Rory indicated that at his institution, funds for such projects were limited, and unions and the collective agreement inhibited provision of additional funds for course or OER development. However, faculty could receive honoraria from outside the university. Rory suggested that, instead of offering financial incentives, the university could liberate faculty from courses to do course development, which was an accepted practice. It remains that Rory and the OERu CEO did not see how developing openly licensed courses was different from any other course. Thus, they didn't see how additional funding could be obtained for completing work that was already a part of staff responsibilities. In Figure 6.13., this stressor is located at position 6.a.

Stressor 6.21.* Enabler: Slow pace of innovation

According to Wayne_AD, one enabler was the pace of innovation. He explained a decision made in the early stages of the OERu, which was:

> not to innovate beyond the capacity of society or the economy to accept the innovations. In other words, we've restricted our innovations to two things: one is the courses are based entirely on OER and the second is the disaggregated model of service provision. In other words, separating assessment services from the full package.

He added that the OERu was not at the time working on badges for assessment; he preferred to see if another institution would develop this innovation. As mentioned in Chapter 5, the OERu did eventually adopt badges through the EduBits program.

While the slow pace of innovation may have been an enabler for planning and sustainability, OERu Partner Institutions wanted to see an increase in enrollments in OERu courses (John_AD; Stephen_AD) (OERu, 2017e, 2018f). John elaborated by saying that seeing more students taking

OERu courses would motivate more PIs to contribute to course development and other OERu projects. Further, at the 2017 Council of CEOs, it was suggested that the OERu had not taken enough risks and that the characteristic that had previously set the OERu apart – providing free courses for credit – was being adopted by its competitors (OERu, 2017g).

Despite these concerns, the OERu had made progress in a variety of ways. In the OERu's 2018 mid-year report, the following achievements were noted: the development of 55 micro-courses (or 2200 notional learning hours), the approval of three qualifications which were certificates recognized at three institutions each in a different country, the approval of credit transfer across institutions in Canada, New Zealand, United Kingdom, and United Stated, the development of an open source NGDLE, 703 registered OERu learners, and the development of a learner support site and automated messages providing learners with information about courses (OERu, 2018h).

Looking to the future, as per the OERu Strategic Plan for 2018-2021, the aim was to reach 10 000 learners in 2020 and 15 000 learners in 2021. To help the OERu achieve these goals, the Council of CEOs decided that the OERu should hire additional staff or contractors to help launch more courses. Previous to this meeting, the OERu had someone working on a secondment from Otago Polytechnic for launching OERu courses. Additionally, three Canadian universities contributed funds or hired personnel to help with launching courses. One suggestion was to seek out a sponsor now that the OERu had managed to obtain approval for credit transfer and could define output targets and deliverables related to the courses in the 1st year of study (OERu, 2018g).

Thus, the innovative venture that was the OERu had been taking a cautious approach to its planning of major changes that were intended to become a part of mainstream practice in worldwide institutions. To increase the pace of course development, John_AD suggested that more of that type of work be distributed among the partners. This suggestion came as a reminder of the original plan

of having each partner contribute two courses to the OERu. The contribution was considered to be a relatively small one for each partner and as such was intended to pose a low risk for them (Wayne_AD). In Figure 6.13., this stressor is located at position 6.a.

Stressor 6.22. Enabler: Motivation through encouragement

Wayne_AD said that the OERu encouraged partners to complete their courses through motivation and support (energy). Similarly, Rory said the OERu provided leadership and support when asked what kind of management approaches were useful for motivating faculty to use or create OER. He added that it was important not to force anyone to do this work or else they would resist. Rory added that subject matter experts or faculty who were delivering the course had to have the final word on content and quality because of academic freedom. Both Rory and Wayne_AD agreed that there was no pressure for partners to contribute the courses, as they understood that this work can take time. Wayne_AD explained that even when partners were not contributing to the OERu by developing courses, they were already contributing through their membership fees. Stephen_AD also said that faculty and staff tend not to accept changes that are forced on them. One way that OERu used to motivate IPs to produce courses was to encourage them to develop institutional action plans (e.g., OERu, 2015a). It is not clear how effective this approach was. In Figure 6.13., this stressor is located at position 6.a.

Stressor 6.23. Enabler: Distribution of work among partners

Another strategic enabler of the OERu's course development work, according to Wayne_AD, is that it was spread among the OERu partners. Each partner was asked to contribute two courses to the OERu. Rory thought that such work might be motivated by a spirit of "coopetition" (a combination of competition and cooperation) as he called it, whereby his institution's successful open course development could motivate other IPs to build courses. In Figure 6.13., this stressor is located at position 6.b.

Stressor 6.24. Enabler: Practice of seeking out champions

The OERu sought out champions to promote OER, according to Wayne_AD and Rory. Champions (various species) of OER are defined by their personal volition to engage with OER. This approach of seeking out OER champions was an enabler in that it was a decisive action about filtering for people the OERu would work with: educators passionate about open education. These champions spent energy advocating for OER use within their organizational ecosystems, particularly in the professional sector to encourage colleagues (various species) to get involved with OER. They advocated in the bureaucratic sector to encourage executive species in their institution to support OER engagement, and in the resource sector by using and creating OER. OER champions could also act as advocates in the global ecosphere.

One issue with champions is that if they are not working in the context of an institutional culture that supports innovations in OER and OEP, those innovations are not likely to be sustainable (Coughlan et al., 2019). Indeed, OER users benefit from the various viewpoints of other OER users in their professional learning environments as well as the social interactions for support, especially when trust has been built (Hood & Littlejohn, 2017). Thus, networks help champions to sustain their OER engagement. These findings indicate the importance of increasing awareness of OER and open education in strategic ways, such as working with OER champions. They also highlight the importance of supporting champions in spreading awareness and use of OER in their institutions in sustainable ways. In Figure 6.13., this stressor is located at position 6.b.

Stressor 6.25. Barrier: The OERu's perceived need for a change of culture regarding OERs

A barrier to OER adoption was the concern about using work authored by someone else, as reported by Wayne_AD. Even though there may have been resistance to using other's material as OER, Rory's view was that most faculty members he knew used commercial textbooks written by others, particularly at the undergraduate level. In graduate courses, faculty tended to produce their own materials. In agreement with Rory, but from a different perspective, Wayne_AD indicated that he understood the concern that faculty had of using work produced by others. He said there was a

culture change required where faculty needed to go from *sharing to learn* to *learning to share*. He elaborated on this point:

> There's a big cultural chasm that needs to be crossed in these open developments. The way I like to explain the differences in culture is that if you look at an open source software developer who tackles a project to develop a new software application. The very first thing they do is to have a look at which code exists that they can re-use to build the new application. Whereas with inexperienced open course developers, the natural approach is not to go and look first what OER and open access materials exist. They tend to want to create their own stuff first and release it openly. There's a very different culture in open design. We do not start from developing our own stuff. We start from looking up what stuff is out there that we can re-use. It's a significant difference in the cultural approaches that we use in these open developments.

A similar issue was that institutions generally recognized individual rather than collaborative work or work where a person could legally copy content and use it in their own course (Wayne_CD). Wayne_CD and Rory avoided developing a course from scratch, preferring to start with openly licensed materials where possible.

One point of using OERs is to save time and consequently lower costs of production and increase the sustainability of education systems. However, as reported by the OERu CEO, faculty new to course development often begin by working from scratch. Therefore, learning to use OER involves the stress of changing the culture. The intended result is to that faculty would have a habit of searching for suitable OERs and adapting the OERs to fit them into a course design and a program design. The culture change also could involve collaborating with faculty from the same or different institutions (Rolfe, 2012), which happens to correspond to the Clan values. Meanwhile, Coughlan et al. (2019) described in their terms an Adhocracy as being ideal for sustaining innovation involving OER. They write,

> Institutional cultures which identify as radical, agile or transformatory may act as incubators for open innovations, or facilitate the spread of an innovation across an organisation. Alternatively, it may be that risk-taking innovators in more conservative organisations are more likely to seek out opportunities shared from elsewhere (p.172).

One enabler (stressor) they suggested for developing a culture supportive of OER engagement was the presence of an OER influential advocate (keystone species), a position supported by OPAL

(2011). This role was important not only for promoting OER, but also for educating faculty and executives about the legal issues related to open licensing so that they could be more welcoming of OER engagement. Alternatively, Coughlan et al. (2019) proposed presenting OER as a solution to an existing problem. The intention was to enable OER to become a part of the institution's mainstream practices. Rolfe proposed that OER engagement required changes in organizational cultures and structures and suggested that trust and self-confidence in building OER needed to be developed so that faculty would feel comfortable sharing and borrowing OER. Along with developing self-confidence is the struggle individuals encounter as their mindsets and identities change to that of an open educator (Cronin, 2017; Tur, Havemann, Marsh, Keefer, & Nascimbeni, 2020). As John_AD commented, to embrace openness is also to embrace a different ideology. In Figure 6.13., this stressor is located at positions 6.a. and 6.b.

Stressor 6.26. Barrier: Challenges of working in an open online environment

Wayne_CD believed that faculty often did not possess the skills required for the OERu's style of course development in open environments. He explained,

> Educators are not familiar with open design methodologies. They're not used to doing it in this way. They have very little experience in using open tools for collaborative development and the cultures and ethos that are associated with collaborative design and development (Wayne_AD).

A perceived barrier to designing courses on an open platform was that others around the world have access to the work-in-progress (John_CD). John_CD and his three colleagues had to overcome concerns of working openly. He explained that at first, he and his colleagues were hesitant to develop their course openly for fear of having their work-in-development criticized or misunderstood. When they realized that only a small number of people would see their work and would be supportive (provide energy and matter in the form of course content), their fears dissipated (and they gained energy). He added:

> it takes time for people to have the courage to really fulsomely get involved. It takes time, and as you're bringing new people in, those new people are having the same experience. I see it as a constant cyclical approach to organizational culture.

A lecturer in a South African university overcame similar concerns as John and his colleagues (Cox & Trotter, 2017a). For her, making her work openly available produced great anxiety because of the potential exposure and scrutiny from her colleagues. She was worried about "being found out and humiliated. It's taken a long time for me to actually feel like I belong at the university, like that I'm good enough to be there" (Cox & Trotter, 2017a, p. 315). As for Samantha and Stephen, neither of them mentioned a fear of working openly online. Indeed, they welcomed comments on their work and would have liked to receive more than they did. Samantha in particular mentioned her gratitude for the comments she received since they helped to increase the quality of her course. In Figure 6.13., this stressor is located at position 6.b.

Stressor 6.27. Enabler: Learning theories for open learning

In my interviews with course developers, learning theories that were mentioned were the interaction equivalence theorem (Miyazoe & Anderson, 2010) and constructionism. Student-student interaction is promoted by the OERu CEO on the basis that Anderson's theorem of interaction equivalence (Miyazoe & Anderson, 2010) claims that learning will occur if either of the following types of interaction is present: student-teacher interaction, student-content interaction, or student student-student interaction. In Figure 6.13., this stressor is located at position 6.c.

Stressor 6.28. Enabler: Volition of students to engage

The options for engaging in the OERu's courses were as for-credit, not-for-credit, and self-directed or open cohort in an open-boundary course. Students also had the option to engage with others to the extent they wished to use open source technologies. Once they began a course, they had the option to quit the course at any time. In Figure 6.13., this stressor is at 3.f. for any student in the course ecosystem, whether for credit or not. It is located at positions 3.g. and 3.h. for international and NZ-based students respectively, and who are not enrolled in any capacity in a course.

The stressors of this chapter are presented along with those of Chapter 7 in Appendix 8. In that appendix, the stressors are organized into tables, where they are categorized according to the six

categories of the OER adoption pyramid (Cox & Trotter, 2017b). There are seven new stressors related to OER and OEP (Table A8.1) not mentioned in the literature that I consulted. The eight stressors that are new and related to the OERu are identified (Table A8.2), as are the 27 stressors that confirm previous findings (Table A8.3). There are six stressors that extend findings in the literature (Table A8.4). They feature characteristics that differentiate them somewhat from existing findings.

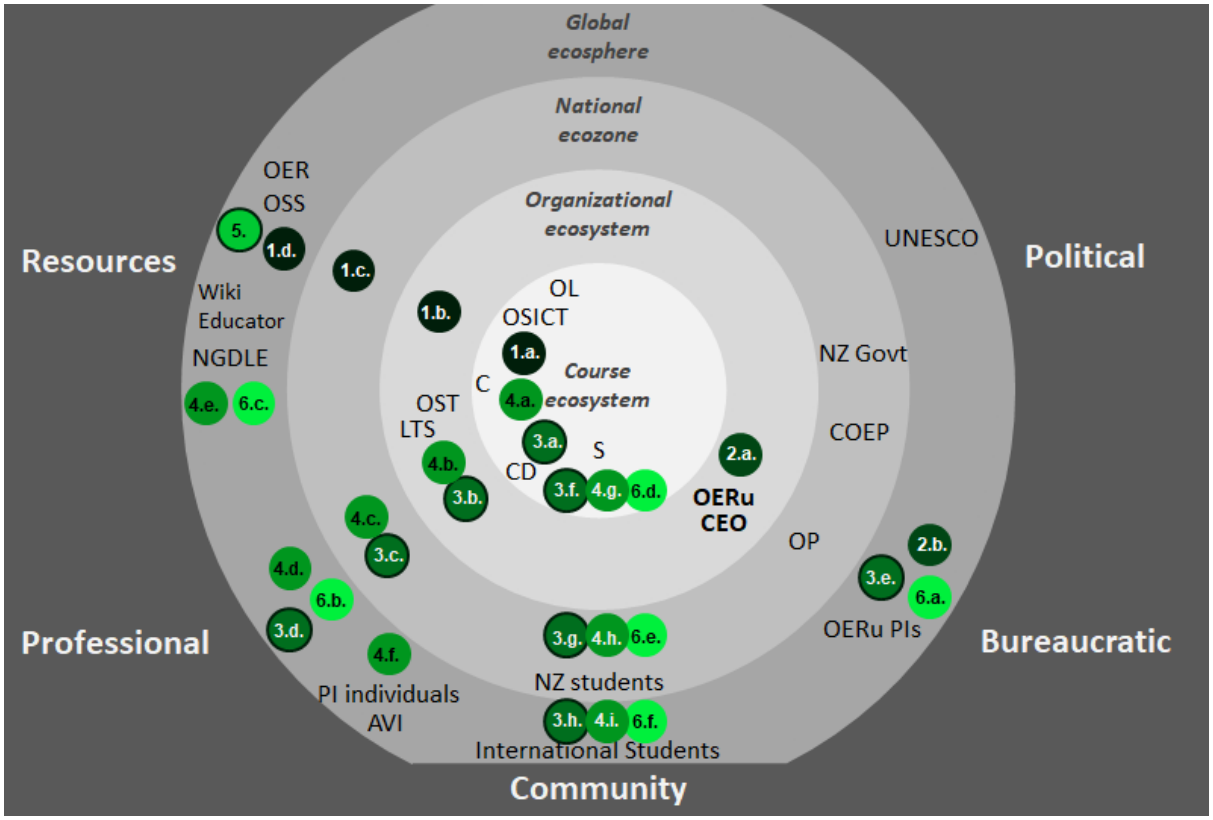

Figure 6.14. Arena of OERu's stressors and matter

In exploring the OERu's system, I found relationships between the stressors and matter shown in Figure 6.14. One aspect of the OER adoption pyramid that can be disregarded in this analysis is the control differential between faculty and the institution. That is because there are no faculty members at OERu, and any course development conducted by OERu employees would be done in the name of the OERu. The four stressors related to Access are in the Resources sector and relate to

the potential access issues that OERu students could face. The Permission category was moot with regards to the OERu since all course development was done in the name of the OERu. The stressors of Awareness are aligned with the Professional sector and relate to awareness and understanding of OER and related concepts in the OERu's network. The stressors of Capacity are found in the global ecosphere because they represent the resources that had the potential to support capacity of PIs in developing OER. There were no stressors among the findings in the category of Availability. However, there is the potential for stressors as indicated by the literature; if the OERu wants its PIs to make their OER available, it can take measures to address relevant concerns. The stressors in the Volition category lie in the Bureaucratic, Professional and Resources sectors and are only found in the global ecosphere because they relate to PIs. They included points about how the OERu related to its PIs and to individual members of the OERu, the OERu's purposely slow pace of innovation, and the OERu's views on a need for culture change among the PIs regarding their views on sharing and adopting OERs.

6.4. Conclusion

The findings in this chapter were intended to provide answers to the following guiding sub-questions:

- **How is the OERu implementing OEPs, particularly for instructional design, development, and delivery of open education?**

The OERu was committed to developing courses that were as openly available to students as possible based on their licensing, their inclusion of open source technology, and the delivery as open boundary courses. Individual members of the OERu had advanced a definition of open pedagogy, though the OERu did not impose any particular pedagogy on its PIs. The OERu had methods for building OER that involved the PIs. The question of designing for unknown students was addressed and remains to be resolved. The OERu provided a variety of resources for guiding the development of openly licensed courses, and they related mostly to formatting and technological issues. An

anecdote about a course that was developed and delivered through a partnership between Wanda's institution and the OERu revealed challenges that Wanda resolved based on her knowledge and experience in online education. The LiDA course was examined through its processes of design, development, and delivery to provide detailed insight into how anyone interested in building OER using open processes and open source tools might proceed.

- **What are the stressors involved in OER engagement and OEP implementation?**

An analysis of the stressors uncovered in this research showed that the OERu's provision of open access infrastructure could be seen as an enabler in the Access category. The OERu's role in the Permission category was passive as it depended on PIs producing and sharing OER, whether it is the institution or individual staff members who were recognized as the authors. Stressors related to Awareness involved the OERu taking a variety of measures to inform PIs and correct their misconceptions about OERs. Stressors in the category of Capacity involved the methods and open source tools the OERu used to support capacity building for developing OER. The category of Availability contained no stressors, and the Volition category touched on how the OERu promoted OER engagement in its network. Thus, the OERu's stressors related mostly to using a variety of methods to build awareness of OER, to build capacity to engage with OER, and to relate to PIs and individual OERu members in a way that supported their volition to engage with OER.

Chapter 7. Vignettes of OERu Partner Institutions implementing OEPs

Having explored the OERu's organizational culture in Chapter 5 and the processes of course design, development, and delivery as well as the stressors related to its engagement with OER and OEP in Chapter 6, we now turn to similar explorations of IIIU and EEEU. The findings in this chapter are intended to answer all of the guiding sub-questions while examining to separate vignettes of IIIU (section 7.1) and EEEU (section 7.2). The vignettes begin with a synopsis of their respective cases and continue with an elaboration of the findings. The first question addressed in each case study is: **What is the typology associated with the organizational cultures of IIIU and EEEU?** To answer this question, I began with an examination of each PI's organizational strategy, structure, and space. They allowed for a cursory analysis of the organizational culture using typology from Cameron and Quinn's (2011) CVF. These findings aim to indicate how organizational culture can influence OER engagement. They also provided the context for the remainder of the respective vignettes, which aim to answer this question: **How are the IIIU and EEEU implementing OEPs, particularly for instructional design and development for open education?** I examined the full Arena of IIIU as well as the organizational and course ecosystems of EEEU to describe their respective processes of OER and OEP engagement as well as the design and development of an OER. This analysis was conducted using Davis' (2018) Arena. Consequently, an Arena diagram supports the vignette of IIIU and EEEU in Figures 7.1 and 7.2, respectively. These findings aim to reveal the complexity of the processes within a system when engaging with OER and OEP, and how ecosystems can evolve or be directed to evolve with education, technology, and openness.

The examination of these cases led to the identification of a variety of stressors that I analyzed in section 7.3 to answer this guiding sub-question: **What are the stressors involved in OER engagement and OEP implementation?** The associated findings will be interpreted using Davis' (2018) Arena, which was extended using Cox and Trotter's (2017b) OER adoption pyramid. The stressors from both PIs are analyzed together and organized according to the Pyramid's categories.

They are mapped onto one Arena diagram (Figure 7.3). Following this analysis, I plotted the stressors along with the matter of IIIU in Figure 7.4 and of EEEU in Figure 7.5. I interpreted these diagrams to show patterns in the stressors and how they relate to the PIs' matter. This portion of my study aims to examine factors that influence OER and OEP engagement to stimulate thought about how to better plan in future instances. Details used in describing IIIU and EEEU are intentionally vague, approximate, or omitted depending on the topic. This approach was taken for the ethical reason of avoiding identifying the institutions.

7.1. Vignette of IIIU

Synopsis of the case of IIIU

This is a case of a mid-size university that offered self-directed or cohort-based courses and programs for formal academic credit. Not research-intensive, it was a comprehensive rather than technical university. This institution was established as a university modeled on the Open University. IIIU was in a country different from EEEU and the OERu. It originally provided print-based materials to students who were within a particular region of that country and who did not have the means to attend classes on-site at a university. With time, IIIU expanded to offering face-to-face courses. Later, it began providing distance and face-to-face education to domestic and international students. IIIU had a team in one department working on open and distance education. A restructuring process occurred, resulting in the removal of services from the open and distance department and transfer to the central university administration.

The staff prided themselves on offering courses to students who otherwise would not have been able to obtain a formal tertiary education. There were no pre-requisites for IIIU's courses, but there were advisors who helped in determining whether students were prepared to enroll in a given course. IIIU offered accreditation for prior learning mostly for domestic students. Additionally, students could take an exam without studying in a course; if the student received a sufficiently high grade, a credit was awarded.

IIIU strongly collaborated with academic and non-academic tertiary institutions to develop OER and share knowledge about educational technologies. IIIU was a founding partner of OERu, and employees of IIIU participated in the OERu's face-to-face and online activities. IIIU staff developed courses for the OERu, and as my research came to an end, were accrediting courses for the OERu.

IIIU's organizational strategy and structure

The offerings of IIIU were 50 programs and hundreds of courses for credit that were recognized by several other institutions. IIIU offered courses in all modalities (online, blended, face-to-face) and formats (digital, paper-based). IIIU's organizational strategy was partially described through its mission and legislated mandate. The paraphrased mission consisted of providing a high quality education to domestic and international students using multiple modalities supported by research. According to its mandate, it was to provide undergraduate and master's degrees, adult education, vocational programs, open education, and recognition of prior learning acquired through experience, accreditation for courses from other institutions, or accreditation based on taking a course exam. IIIU was considered a midsize university with 25 000 students, with approximately half on campus and half at a distance. Approximately 1500 students took courses both online and at a distance. Among the on-campus students, 80% were domestic and 20% were international. Among the distance students, almost 90% were domestic. These numbers refer to the academic year of 2018-2019.

According to Stephen_AD, IIIU was overseen by several bodies: the Senate, the Board of Governors, and the Regulator of Real Ruminations (RRR) an anonymized body that oversaw open and distance learning. According to Stephen_AD, the members of RRR were appointed by the regional government. Stephen_AD also indicated that it was the RRR's responsibility to ensure that IIIU fulfilled its open learning mandate. As well, it oversaw issues regarding residency and pre-requisites

and ensured that IIIU had structures and processes for offering credits for prior learning. Stephen_AD described one of these processes:

> This is a process where credentials can be assessed, for example, for people who work in the military or in the industry - outside of the traditional tertiary education system. Some of those credits can be recognized at the university level. For example, a management program taken at McDonald's may be accredited by [IIIU].

As Stephen_AD explained, in the past, IIIU had student advisors and departments for registration, finance, planning and analysis, marketing and communications, and project management. However, in early 2016, these departments were removed and merged with the centralized services of the parent institution. As a consequence, Stephen and Samantha's department had less influence on open education than it did previously.

IIIU's organizational space

The environment of IIIU where Samantha, Stephen, and Trevor worked was a department that occupied part of a purpose-built six-storey building on campus (Stephen_CD, Trevor). Stephen_CD said that it originally contained a broadcast production studio on the first floor. The second floor was occupied by IT personnel providing service to the entire campus. The third and fourth floors were not described. The fifth floor was for the registrar and other student services, originally just for the department, but later shared with the whole campus. The sixth floor was for Stephen, Trevor, and Samantha's department, mainly curriculum development and delivery services along with media development. The department's footprint shrank with reorganization to one floor. As a result, all of the department's staff were in one space on one floor and were somewhat isolated from the rest of campus. Trevor added that the sixth floor was a secure space because it contained student records, exams, and the like. Anyone who was not a member of staff could only wander in this area if they were accompanied by staff from the department. Trevor also indicated that the sixth floor space contained cubicles for approximately 60 staff members and offices with a window for those in positions such as that of director, like Trevor. Much of Trevor's staff were located

directly outside his door, while other staff were dispersed throughout the floor. Trevor described the university as new, and his department's space as more comfortable than others he had known.

IIIU's organizational cultures

Trevor described the organizational culture of IIIU as being focused partly on work habits: staff arrived early and were focused, quiet, professional, and friendly. The staff created a comfortable work atmosphere and, in Trevor's view, had a good work-life balance. They left after their approximate eight hours of daily work were done, while senior managers occasionally stayed later. This description indicates that work ran in an orderly way at IIIU, which suggests a Hierarchy with a focus on the value of stability and structure. Some people worked from home, but others could not, due to union rules. Additionally, Trevor believed that the culture was to value "process, communication and coordination" which further corresponded to a Hierarchy, this time with a focus on both internal integration and order. However, Trevor would have preferred if IIIU were more agile (Adhocracy), which aligned with the OERu's agile approach to course design. When asked to describe the culture in terms of the Competing values framework, Trevor said that all four cultural value sets were necessary. He added that there had been a high turnover of senior leadership over the few years prior to his interview and that, while the work culture was healthy, it could improve following the then-recent changes.

While Trevor promoted all four value sets of the Competing values framework for open education, Stephen_AD and Samantha preferred a risk-taking and innovative culture interested in providing education in various ways. That response was aligned with Samantha's view that her department sought out innovative projects and documented the lessons learned for the benefit of future projects. This corresponded to an Adhocracy given the interest in innovation and continuous improvement. However, the department usually designed courses for efficiency, which corresponded to a Hierarchy due to the internal focus and the interest in controlling and structuring

the work. She added that "[h]aving an open philosophy doesn't always translate well to practice" because the "silo" effect separating departments inhibited sharing, which further hinted at a Hierarchy because of the highly structured nature of the institution. These findings illustrate the result of having innovation and openness within one department as opposed to adopting these qualities throughout the whole institution.

Despite the challenges in collaborating across the institution, there were attitudes and behaviors within Stephen's department that were indicative of a commitment to values of supporting open education for the benefit of students. Stephen_CD said "There is also a culture of believing in and supporting open access to learning in as many ways as possible." According to Stephen_AD,

> Where the culture is manifested is in the continued work to develop and deliver flexible and distance courses. Our use of OERs, our support of open educational practices, and our partnerships with students and our library to continue to promote and advocate for open textbooks, resources, and so on.

This description suggests a Clan due to the focus on values of flexibility and unity to empower students. Similarly, Samantha expressed that, since her department received government funding, it only made sense to apply open licenses to the courses. According to Samantha, Stephen_CD, and Trevor, this aspect of organizational culture was manifested in the department's habit of obtaining funds for open projects and of collaborating with the Society of Spectacular Sophists (SSS) (an anonymized organization promoting OER in the same country as that of IIIU). It was also manifested through IIIU's collaborations with the OERu, OERu Partner Institutions, and other tertiary education institutions located in the same region as IIIU. Trevor also described IIIU as having a culture of heavy participation in the OERu's activities since its foundation in 2012. Strong collaborations such as these with other organizations are also indicative of a Clan because they show that unity, teamwork, and the dynamism to engage in projects as a collective were valued. In addition, Samantha and Trevor agreed that the staff were proud to offer education to a segment of students that would otherwise not have received an education. Trevor elaborated,

> We serve people that otherwise wouldn't be able to attend post-secondary education or have access to it. And people here do take pride in that and are very mindful of it and definitely have a sense of protectiveness over it. […] I would say almost everyone on staff that's here for any length of time starts to kind of take on that element of the culture.

In summary, the Hierarchy seemed to dominate general work processes. That is because the physical space, the work schedule, and the silo structure lent themselves to efficient and orderly work with an inward focus and a focus on control. Despite these advantages, Stephen and Samantha would have preferred less structure. Thus, the Hierarchy seemed to present the disadvantage of hampering innovation that would have been more supported with a stronger Adhocracy. The Clan appeared to dominate the staff's attitudes towards and interactions with students. This finding was indicated by the internal focus on unity of staff with students and the focus on adapting to students' needs through services offered to them. It also appeared to be a strength that was cherished by Samantha, Stephen, and Trevor. The Clan also seemed to be cherished because of its manifestation as the harmonious integration with other institutions. The Market was not directly mentioned in questions about organizational culture, but Trevor recognized its role and the value of balancing all four of the cultures at IIIU. The lack of direct mention of the Market is not surprising given that the focus at IIIU seemed to be internal as manifested in the shared values of providing for the organization's students. Further, my data is based on interviews with participants who worked closely with courses and moderately closely with students.

Had I interviewed higher-level administrators, I might have obtained different perspectives on the kind of cultures supportive of IIIU's OER engagement and OEP implementation. In the findings on open educational practices at IIIU, Trevor mentioned that his institution carried out market research to inform decisions about developing courses, and Stephen_CD mentioned that offering courses as OER was being explored by executives at IIIU as part of possible business models. These points demonstrate values based on the Market. They also demonstrate the complexity of balancing

different types of culture for different purposes within an organization and that species with differing levels of engagement with OER may prefer particular cultures.

By the end of my research period, follow-up interviews provided a few insights into the organizational cultures. IIIU was increasing its involvement with the OERu by increasing course development and accreditation during my data collection period. This indicates that the organization was increasing its innovation activities with the OERu and strengthening its inter-institutional collaboration, also with the OERu. In these respects, the Adhocracy and Clan were increasing. At the same time, OEP implementation had decreased by having some of the department's services transferred to the central administration of IIIU. With less flexibility and less ability to adapt open education services to students' needs, there was a decrease in Adhocracy. Thus, both the organizational cultures at IIIU and OEP implementation were evolving together.

Arena of IIIU

We now turn to an analysis of the Arena pertaining to IIIU (Figure 7.1.). The orange circle in this Venn diagram is an ecosystem that includes all the matter related to the OER development by IIIU in its pilot project. The blue dashed oval represents an ecosystem, including Exec (Stephen in his administrative role) and the OERu. IIIU's system will be described one level at a time, starting with the global ecosphere and ending with the course ecosystem. The course ecosystem will be described in the greatest amount of detail because the focus of this vignette is on course design and development.

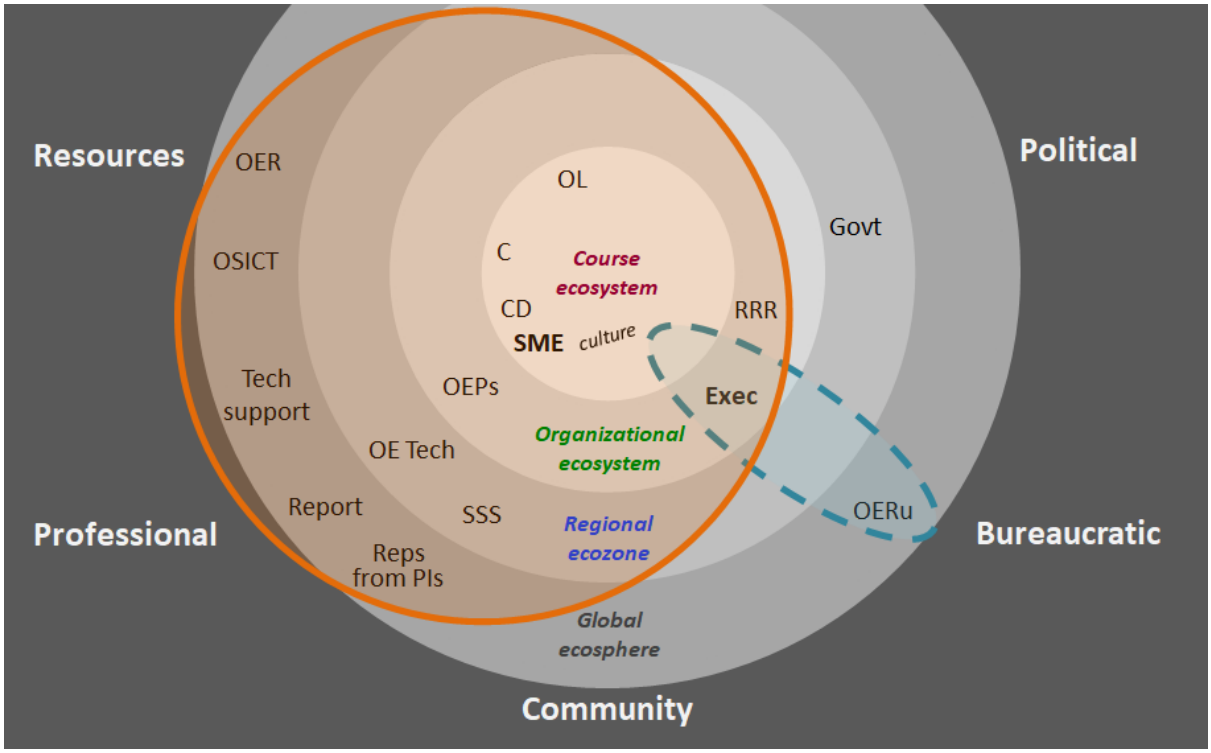

Figure 7.1. Arena centered on IIIU's development of a course

KEY

Course ecosystem

CD refers to the course developers.
C is the course.
OL stands for open licenses.

Organizational ecosystem

RRR is the Regulator of Real Ruminations
Exec is an executive in the organizational ecosystem.
OEPs are open educational practices

Regional ecozone

Govt is the regional government
SSS is the Society of Spectacular Sophists
OE Tech is an inter-institutional organization

Global ecosphere

OERu
Reps from PIs are Representatives from Partner Institutions.
Report.
Tech support volunteer.
OSICT stands for open source information and communication technologies.
OER refers to Open Educational Resources

IIIU's OEPs involving a global organization: The OERu (global ecosphere)

In the global ecosphere, IIIU interacted strongly with the OERu as a founding partner and as an increasingly active contributor of courses. IIIU contributed two courses to the OERu and was in the

process of developing and accrediting ten more for the OERu when my data collection ended. This was according to Stephen_AD, who is represented as both CD and Exec in Figure 7.1. Note that both he and Trevor were keystone species within their department, but not in the organization as a whole. He worked with a faculty member (SME) and an associate dean (also represented as Exec), who was an influential species at IIIU in the bureaucratic sector of the organizational ecosystem to offer credit for all of the OERu's courses. Furthermore, Trevor (Exec) corroborated that IIIU was expanding its role of developing and accrediting courses for the OERu, which are educational and bureaucratic forms of evolution. He added that it was leading development of the courses for the OERu's first year of study. He also explained that IIIU was represented by a significant number of people at every OERu International Partners meeting and this bridging between the two organizations increased the likeliness of success in their shared projects. Such success is related to the alignment of ecosystem communities. The associate dean took on a leadership role in this work and aimed to ensure that courses accredited by other OERu partners would align with IIIU's accreditation process. Stephen_CD saw the potential for stronger partnerships among the member institutions of the OERu:

> One of the findings of my own research was that for this to work better in the future and become more robust, it does require a strong Community of Practice (CoP). One of the things holding back a CoP was the notion that was agreed on early within the development of the OERu that there would be no one agreed-upon instructional design model or approach or theory used because the idea of institutional autonomy was held in high regard, so the partnership was not going to dictate to any institution how to design their courses. The downside of that was that everybody worked on their own. One of my recommendations from my own study was that we do build a CoP of open design and development within the OERu network and empower them to create learning design models or templates or shareable learning designs. That could help build a community of expertise in design and development.

This quote highlights a desire of an individual from a PI for the OERu to provide more guidance and resources regarding pedagogy. In other words, PIs were interested in seeing the OERu evolve educationally. There is also an expressed interest in forming stronger mutualistic relationships among the PIs. The suggestion that the OERu hire people to create templates was stated before the OERu opened two LTS positions. The LTS role did not involve template creation, but it did involve

course development. Thus, the OERu was beginning to respond to PIs' requests for an increased focus on educational aspects. Stephen_CD expressed that such actions to foster a CoP were not likely to occur partly because of the complexities inherent in the complexity of having globally distributed PIs.

IIIU's OEPs involving national and regional organizations (ecozones)

There was no federal government agency or department that oversaw course development in IIIU's country; this work was within the realm of the regional governments. IIIU was mandated by the regional government in the [IIIU] Act with some support provided at the federal level. In addition, the regional Ministry of Education (Govt in Figure 7.1.) in the political sector provided grants distributed through SSS, which managed the administration and adjudication to deliver on a given project (Stephen_AD). For this reason, it is located in the bureaucratic sector. As further explained by Stephen_AD, IIIU had an informal yet strong partnership with SSS; Stephen and Samantha had developed a second course (besides the one central to the Arena explored in this research) using a textbook from SSS.

In addition, several instructional designers from IIIU were on SSS committees, forming bridges in the professional sector across the two organizations. Samantha (CD) and Stephen_CD mentioned that the two institutions developed and delivered workshops on adopting and adapting OER. In addition, staff from IIIU participated in workshops delivered by SSS on these topics: accessibility and UDL, collaborative facilitation techniques, planning courses, and facilitating learning technologies. SSS worked on projects that nurtured collaboration and networking among regional institutions, according to Trevor. He explained that SSS favored multi-institutional grant proposals and that their staff were always ready to help. One fruit of these collaborations was OE Tech (in the Professional sector and regional ecozone of Figure 7.1.) an informal inter-institutional group (Trevor, Stephen_AD). Its goals included the promotion of co-evolution of technology with education. This co-evolution was nurtured by using open source software applications for instruction, providing

guidance regarding open pedagogy, promoting inter-institutional collaboration regarding the use of open source software, encouraging technological autonomy over one's data, lowering the barrier to using the internet for regional staff and students, and supporting regional tertiary education instructors to be more critical regarding pedagogy and open source technology (n.a., n. d.). In short, the regional ecozone was highly productive and fostered mutualism among several institutions.

The role of IIIU in open education and instructional design (organizational ecosystem)

According to Stephen_AD, IIIU was well suited to developing open courses considering that it specialized in developing open online courses: its staff formed a rich ecosystem community of organized species skilled in instructional design, course development, production, using LMSs, editing content in different types of media, and copyright. Some of these roles are not represented in Figure 7.1. because they were not involved in developing the course for IIIU that is the subject of this analysis. They were also experienced in online teaching and had expertise in different subjects. Stephen_AD added, "There is also a culture of believing in and supporting open access to learning in as many ways as possible." Over five years, IIIU gained skills with regards to developing courses for the OERu with the guidance of Stephen_CD and Samantha. Initially, they were the only two people developing an openly licensed course, but they evolved their organizational ecosystem by expanding their team to twelve people, as recalled by Stephen_CD. Samantha also explained that the instructional designers tried to use OER when developing courses and putting CC Licenses on other courses at IIIU as a general practice. These findings demonstrate how two OER champions built an OER development team from within their institution, effectively causing an evolution in both technology and education. This evolution was facilitated by having highly qualified and diverse course development species in the organizational ecosystem.

IIIU's work in developing courses for the OERu required more than capable staff. Administrative support was required for such initiatives, as explained by Stephen_CD. Within the organizational ecosystem he supplied energy through advocacy for OER engagement and related topics: funding,

the politics related to open education, and grants. Stephen's view differed from that of the OERu, which was that involvement of administrators did not lead to an increase in OER production.

Stephen_CD and Samantha mentioned that students were advocates for OER since they saved funds when they could use open textbooks instead of commercial ones in their courses. Stephen_CD explained that students lobbied for OER. Rory said the same about the students from his region, adding that they were a driving force for OER. A stressor was found when introducing change to the usual practices through OER advocacy. As explained by Stephen_CD, "It can be a nuisance to introduce processes that are outside of the mainstream. People can become resistant or annoyed by it. It takes finessing." Stephen_CD spoke from experience since his advocacy for the OERu and development of open courses involved giving presentations to species throughout his organizational ecosystem, including the Senate, the Board of Governors, faculty groups, staff within his department, his managers, the president, and staff who attended professional development sessions, in other words, he reached out to diverse species. This advocacy was successful, considering that Stephen_CD and Samantha were able to make the work on open courses a part of the regular processes of IIIU, thus enabling its evolution into an ecosystem that produced OER sustainably. This point will be further explored in the analysis of the course ecosystem. In addition, the senior administration, including the president saw value in IIIU's partnerships among the OERu network in terms of reputation and potential growth.

Program design was a consideration when IIIU developed its course for the OERu. Considering the amount of courses that IIIU intended to accredit for the OERu, it was important to consider program design so that the courses did not overlap unnecessarily or leave curriculum gaps. The process for course development within the context of program design was explained by Stephen_CD:

> There are two approaches to that: [One approach is that y]ou may want to select a new course to develop as an open course that doesn't compete with your existing courses. So you can look at it as a course that fits into your existing body of courses that you can

> deliver on a regular basis as well as part of the OERu but is new. The other is to design a full program including opening up existing courses. Generally, you always have a program in mind, of course; there's little point of courses on their own.

Trevor added that IIIU had a sturdy process of program design. He gave an example where his department was working in partnership with his institution's department of Business to create a Master's program. The Business department was expected to decide on outcomes and course topics, though Trevor's department also could have consulted external subject-matter experts. After discussions involving both departments, a proposal was normally submitted to RRR that oversaw open education programs. RRR examined whether the proposed program was aligned with the university's goals. It met four times per year and had a strict process that included rigorous analysis and market research. Trevor explained that outright rejections were rare since informal work was usually done previously to proposal submission to increase its quality. The analysis of the organizational ecosystem showed that it was highly organized and divers with highly skilled staff.

Course development (course ecosystem)

The process started by copying content (represented as OER in the Resources sector of the global ecosphere in Figure 7.1.) from a course developed by Washington State in a project funded by the Gates Foundation. The course was subsequently adopted by Saylor.org. The course, as published by Saylor.org had a Creative Commons Attribution (CC-BY) license (represented as OL in the course ecosystem) (Saylor Academy, 2017), and Stephen_CD selected it for this reason. When Stephen_CD and Samantha completed the course, they applied a Creative Commons Attributions ShareAlike (CC-BY-SA) license to it. When selected for adaptation by IIIU, the course was composed of a variety of file formats such as Word Documents, html, and pdf. Stephen_CD and his team needed to convert these files to wiki text so that they could be placed in the OERu's WikiEducator platform (OSICT in the global ecozone in Figure 7.1). Other materials had to be replaced if they had CC licenses more restrictive than CC-BY and CC-BY-SA as per the deboning process that Rory mentioned. Stephen_CD and Samantha replaced this content by either developing new content and applying a CC license to it, or finding content online, mostly in the MediaWiki Foundation database. They then inserted the

suitably licensed content into the course. Saylor's version of the course contained a large amount of American-themed content, so Stephen_CD and Samantha modified the course to include examples representing more diverse cultures. This point illustrates that knowledge of both technology and pedagogy facilitated the completion of this project.

In the project to develop IIIU's first OER for the OERu, Stephen_CD focused mostly on technical work required for entering content into the WikiEducator course site and Samantha focused mostly on design with both roles overlapping. The coding in WikiEducator was supported by a volunteer (represented as Tech support in the global ecosphere in Figure 7.1.). These two roles overlapped to the extent that both course developers became familiar with the technical aspects and the content of the course. They also used WikiEducator to consult OERu members in the global ecosphere (Reps from PIs in Figure 7.1.) for review and feedback of the content, obtaining five responses (Stephen_CD). Meetings were logged publicly on WikiEducator, and the Wiki recorded revisions to track the development history (Stephen_CD). Samantha said that she liked using WikiEducator as a tool to enable participation in course development involving people from around the world since it increased the course quality. This point shows that a course ecosystem is productive when it is populated by species with knowledge of both technology and pedagogy.

While Stephen_CD and Samantha were able to find suitable content for this course, it could prove to be more challenging to do so for other courses, commented Samantha. She said that it was not always possible to find OER to develop courses, especially if the course topic was rare or specialized; the internet in the global ecosphere did not always contain desired educational matter. In these cases, the content had to be developed from scratch (Samantha). Another option was to require students to buy a textbook if that was the only source of relevant material (Samantha). When there was commercial content available online, Stephen_CD provided links to it. Even though this was an open course, Stephen_CD did not feel that it was necessary to link only to open resources. He felt

this way because this practice could limit the scope of the course and the students' experience and exposure to valuable material. One example was when specialized collections were available for online viewing. These findings indicate that individual views, economic realities, and luck in finding materials all influenced instructional design for open education.

The IIIU team used digital matter such as Adobe tools, graphic tools, GIMP (an open-source photo-editing tool), and Libre office (an open-source suite of office software programs) for developing the course, which reduced stress in the course ecosystem. Libre Office had a tool for converting text to Wiki text which reduced manual labor by facilitating the conversion of headings and tables to wiki text. This course was developed in WikiEducator, which was normal for OERu courses. However, IIIU had used Blackboard and Moodle, and was phasing out Blackboard while transferring courses to other platforms in a process of technological evolution. Samantha indicated that IIIU was not likely to adopt WikiEducator or WordPress widely since the university required that grades be kept within the LMS, which could not be done in wikis and blogs. However, WordPress could be used in combination with a LMS, as explained by Stephen_CD. Reflecting on what was required to complete this course development, Stephen_AD and Samantha listed the skills related to technology including open source coding in WikiEducator and knowing how to select open source software for students to use in a course. Stephen_CD and Samantha also indicated that those wishing to develop open courses needed to know about open licensing, how to work outside a LMS, how to use wikis and social media, and how to find and evaluate OER. In short, all of the skills and tools used in the course development were related to both education and technology.

Features of this course were intended to nurture a positive learning experience, such as the authentic nature of the tasks. They consisted of project-based, practice-oriented, authentic, and meaningful work (Stephen_CD, Samantha). For example, students could be asked to curate and narrate a collection of resources. The course developers aimed to make the learning activities

engaging. They wanted them to result in a product published online for potential further development rather than a disposable assignment. They also aimed to provide opportunities for skills development relevant to the study topic (e.g., digital storytelling, curation). For these reasons, quizzes and self-tests were used infrequently (Stephen_CD). Trevor also preferred to avoid disposable assignments in favor of openly published projects that contributed to public knowledge in the global ecosphere. He provided one example of a group project to develop a Wikipedia page into a featured article which required meeting high writing standards; the work was accepted as a featured article and the page began receiving two million views per day. It was also heavily copied for an article in a major American newspaper. The openly published work could have other uses beyond the course, such as being used in a portfolio to display students' skills to potential employers or friends in the local ecosystem community (Stephen_CD).

While the focus was on learning about the subject matter, some technical skills were targeted, such as digital storytelling. Such technical teaching was used only to the extent that students could complete their work effectively in a digital environment. The focus on digital skills was low to avoid distracting students from the main course content and possibly discouraging them with technical challenges (Stephen_CD). The course developers knew that another OERu course (LiDA) would be developed specifically for teaching digital skills, so they kept their course focused on the subject matter. The course was approved for credit and was appreciated so much that it was adopted for credit by a department at IIIU (Stephen_CD). Thus, this pilot project was beneficial for both IIIU and the OERu network.

The point about having III's course focus more on the subject matter, while LiDA focused more on technical skills, was the result of program design thinking. LiDA was designed to reduce stress for students so that they would more likely succeed in subsequent online studies, whether through the OERu or not. Thus, the sequence of courses could make a program self-sustaining. It is a desirable

approach to evolving an ecosystem towards a steady state where a large amount of the OERu's courses intended for development would be delivered.

In IIIU's course, students had the option to use a portfolio, blog, wiki, Google Sheets, paper, or any tool they chose. In Stephen_CD's view, OERu courses were "built using open pedagogical practices so that students have freedom to operate in the open as they wish using the tools that they want in creating the kinds of communities or collaborations that they want." This course was developed before the OERu had developed its NGDLE. Additionally, instructional designers at IIIU used Universal Design for Learning (UDL), for example, by including references to Indigenous cultures and by being accessible, as reported by Samantha. She further explained, "We try to offer content in ways that people of different cultures will be able to make sense of it." As an aside, Samantha was a co-author of an article on instructional design for courses that were intended for students from multiple cultures. In short, the course was designed to appeal to students with a variety of interests in communication and collaboration tools and various learning needs.

Once a student had completed a course, it was possible to retain course work because the learning platforms remained open (Stephen_CD). In addition, students could continue to have full access to the teaching materials on the course platform. The practice of allowing students continued access to their work and course content could foster their evolution in their use of technology and how they learned in the long term.

While IIIU normally offered student support in the form of information about fees, educational advising, exams, and orientation, the OERu did not offer these services. Some support could be obtained through student-student interaction enabled by the option to use social media tools as mentioned above. Additionally, Stephen_AD suggested that the OERu was considering the option of providing support on a fee-for-service basis. The support would have consisted of educational and

technological support as well as a student manual to guide students on how to use these tools. Without such support, the learning conditions in the course ecosystem could become too stressful, causing students to abandon it.

Stephen and Samantha acted as bridges between the organizational ecosystem and the OERu in the global ecosphere. As such, they could share their experience of working on this course by discussing it with other OERu members, and they could take knowledge of how the OERu preferred for courses to be developed and apply it in their work. The way they initially developed this course was not sustainable (Stephen_CD and Samantha). One reason is that they completed this work on their personal time while communicating over Skype and email. The amount of volunteer time it took was more than they were willing to give again. According to Stephen_CD, the work could have been done during office hours, but the workload was too high. A second reason that this work was unsustainable was that Stephen _CD and Samantha were doing technical work: converting various formats to wiki code. Development staff usually did this work as Stephen_CD explained:

> We follow conventional instructional design processes where instructional designers develop the content and activities. We pass our work on to other staff who work on technical development. We instructional designers do not work on media development; someone else does that.

Consequently, Stephen_CD proposed to have production personnel at IIIU take over technical tasks, which was approved by the Associate Vice President. Subsequently, the production team learned Wiki syntax and became highly skilled at using it (Stephen_CD). The production staff welcomed this new task because it brought variety to their work (Stephen_CD). With the development of further OERu courses in mind, Stephen_CD decided, as a keystone species within IIIU and on the basis of research he had conducted, that future work of a similar nature would be made a part of the regular work processes. When he and Samantha chose the next course to develop for the OERu, they selected one on the basis that it was already scheduled for updating. This approach was in accordance with that recommended by the OERu CEO. Open course development became

integrated into regular processes and the course ecosystem was made more sustainable with species skilled in both educational and technology aspects. Stephen_CD explained that it would consequently be easier for IIIU to carry on with this work after he and Samantha retired, which occurred during the course of my data collection). The organizational ecosystem was thus prepared to continue with minimal disruption due to the retirements of two species leaving empty niches behind them.

IIIU's process for developing courses involved a form of needs analysis. Trevor explained that IIIU sometimes conducted a market analysis by proposing ideas at conferences and council meetings to obtain feedback on a course proposal. Students were consulted about course design at very early stages, as explained by Trevor, for example, to determine whether an idea should be pursued and developed into a course. Students were also consulted through course evaluation surveys.

Considering the risks of using online platforms and resources, Trevor explained that legal, safety, and privacy issues were important to IIIU. He emphasized, "That's all we talk about anymore". He went on to explain how his thinking had evolved from promoting openness to a more cautious position. This evolution was in response to concerns about identity theft, data collection, and algorithmic manipulations whose processes were not sufficiently understood by educators, in his view. He questioned why there were not more measures taken to promote online activity while protecting students' identities. He offered suggestions:

> some sort of proxy system that would allow for anonymized participation in cloud services. Some sort of authentication mechanism where the instructor might know who that student is but nobody else needs to.

Trevor thought that there was little profit to be made for such a venture, and that this would be an ideal project for federal funding, given the scale of the issue. Such ethical considerations were a consequence of offering courses whose environment was the global ecosphere.

Knowledge of problems and solutions for this kind of topic that is developed at PIs through their extensive course delivery can enrich the OERu.

Course development at IIIU included a quality assurance process. As explained by Stephen_AD, development of this course involved circumventing the preliminary process for getting approval; this process was completed after the course was finished. The course was selected for development because it had already undergone several quality assurance processes by Washington State University and Saylor.org in the global ecosphere. Stephen_CD explained the quality assurance process:

> We opened the course for public review within the OERu community and got feedback on it. We had a faculty member from our Fine Arts department review the course, and he gave it the academic approval and said it met the university standard. They adopted it as one of their own courses afterwards. They liked it that much.

This example is a counterpoint to the concern that OER are of low quality. One point that facilitated course development, quality assurance and accreditation processes was that IIIU had a mandate for open education as stated by Stephen_CD. He added:

> We're advancing this as a pilot with the anticipation that it could create new streams of students that might use some of these courses to get advanced standing and then take other courses on a regular basis. If there were large numbers, we could just do the exams for them, and that could be a business model because [students] have to pay for that.

Projects of developing and delivering open courses through the OERu needed to be financially sustainable, and IIIU executives hoped that they would reach new markets of students through these courses, but the means and methods to implement such OEPs were unclear (Stephen_CD).

7.2. Vignette of EEEU

Synopsis of the case of EEEU

This is a case of a mid-size university that offered over 550 courses and 60 programs to domestic and international students. It was not research-intensive; it was a comprehensive rather than technical university. EEEU was established as a university to offer education to domestic students and

expanded to offer distance learning and OEP to domestic and international students. It was a long-term goal for EEEU to become a national leader in open education and to use this characteristic to differentiate itself from national competitors. Employees throughout EEEU supported OEP in different capacities, and students used only openly licensed textbooks in EEEU courses. Its OEPs were increasing and were supported by internal funding during my data collection period. EEEU offered accreditation through distance and face-to-face programs and single courses. EEEU offered a variety of study options to prepare and qualify prospective students for some of its undergraduate programs. The staff prided themselves on offering courses to students who otherwise would not have been able to obtain tertiary education. EEEU became a partner of several international organizations working in open education, including the MIT open courseware group. EEEU was also a partner of the OERu and attended its online and face-to-face meetings.

EEEU's organizational strategy and structure

John_CD described EEEU as a traditional university focused on teaching and not research; it was not a part of the elite universities of his country and did not attract the scale of funding they did. Regardless, the staff at EEEU were proud to serve and support students who were "first in family" (to attend university), from low socioeconomic backgrounds, from rural and remote areas, and who were Indigenous. This finding is significant since it reveals the staff's values that could influence how they designed and delivered courses. In 2019, EEEU had 30000 students, of whom approximately one third studied on campus, and the remainder, online. Of the on-campus students, 75% were domestic and 25% were international. Online students consisted almost entirely of domestic students, while approximately 1000 of them were international.

EEEU's organizational space

EEEU was restructured starting in late 2016. Consequently, John_CD's work space became an open plan filled with cubicles – a change similar to the restructuring of IIIU's office space. Most people previously had offices, and some resisted this change. Some worked in meeting rooms for solitude, and some obtained permission to work from home. The goal of an open plan work space was to

increase the likelihood of staff bumping into each other and having spontaneous conversations to generate ideas or to solve problems (John_CD); these conditions fostered the practice of regular informal consultations as well as the formation of a community of practice. Indeed, John_CD explained that it was a normal practice for his coworkers and him to call out into their shared work space and ask for feedback on their work. This means that they actively made use of the space's collaboration-fostering qualities. John_CD said that the morning often started with conversations about ongoing projects. Many employees were new to the space at the time of John_CD's interview. Consequently, they had fresh ideas to share while those who had been working at EEEU and had a longer institutional memory; the variety of experiences enriched course development at EEEU (John_CD).

EEEU's organizational cultures

The restructuring resulted in major changes in roles, one of which was that John_CD obtained the position of OEP manager – a change from his role as an elearning designer. With this change, he began working on a six-person team including an associate director. This team's anonymized name is "Promoters of Pedagogical Performance" (PPP). Along with the restructuring, there was a change of Vice Chancellor (VC). One consequence of this appointment was that innovations were not being proposed to the VC. John_CD said that staff preferred to wait approximately six months to observe how new managers and the new VC would respond to staff and what kind of impact they would have on the organizational cultures. John_CD was confident that after those first six months of settling into new positions, innovations could happen quite quickly. Over a year after that interview, I conducted a follow-up interview with John_CD, and he reported that the restructuring was ongoing and that projects were still not being proposed. These are indications that Adhocracy had a low prominence due to reduced proposals for innovation and risk-taking to instead increase stability. In other words, the step away from an Adhocracy led towards an increased Hierarchy, at least temporarily.

John_CD described EEEU as a “relational university”. To cope with changes in positions resulting from the restructuring, one way to help the staff to identify other staff was to use postcards, John_CD explained. These postcards were distributed among the faculty and contained titles, photographs, and contact information of librarians, learning designers, and program consultants, among other positions. These postcards were very popular in strengthening the Clan by enhancing the values unity and integration while showing flexibility in adapting to the restructuring and enhancing the sense of collectivity.

The Clan was further suggested in that people who joined EEEU tended to stay for a long time - up to 30 years - because they enjoyed teaching there and considered it a meaningful experience. A similar point was expressed about the teaching culture at IIIU. John_CD recalled,

> A lot of the time, when I'm talking to these lecturers, we would come to the conclusion that if we could somehow bottle them and put them online, that would be perfect because you try to get the personality of the person across, and I think there's a great pride in the student cohort that we attract. The people kind of feel that you're teaching and making a difference.

Hence, John_CD used his role as an instructional designer to capture the lecturers’ personality to make the courses more enjoyable and personable. This approach reflected how he saw his role of instructional designer, and how he influenced course development: he tried to strengthen relationships between students and faculty. It was a further indication of the Clan by attempting to increase harmony within EEEU and enhancing its relational characteristics.

John_CD further described the organizational culture at EEEU as being much like a traditional university in that change occurred slowly. However, its small size allowed for implementing new ideas faster, which is indicative of an Adhocracy. Further, when John_CD and his team members wanted to suggest ideas to the head of their department, her door was open to hear them, and she usually gave an immediate response or guidance. A key point was to inform her of changes before

they were implemented so that she was not caught unaware. The Adhocracy was evidenced by the department head's openness to ideas and fostering creativity by receiving ideas positively.

To further demonstrate the EEEU's Adhocracy, learning designers' ideas were often approved by faculty members, indicating their openness to change (John_CD). The faculty members were sometimes excited enough about course changes that they presented them at the annual institutional showcase. This showcase was an opportunity to nurture a community of practice. However, ideas on a larger scale that involved licensing agreements or legal or ethical issues were slower to be implemented. John_CD added:

> Nowadays, when we're looking at different types of technology that could expose our students to risk, we want to make absolutely certain that we're behaving in an ethical manner towards our students. Those procedures absolutely have to be in place and I suppose what it really comes down to in the organization is understanding when you have to engage with those processes and when it's okay to go out.

This concern for ethics was similar to that of IIIU.

One area that did not change due to the restructuring was teaching and learning, since it was the core business of EEEU, according to John_CD. Course design continued, and John_CD thought that technological innovation was facilitated due to educational technology staff having been dedicated to that task. A community ecosystem at EEEU that favored innovation consisted of a program called The EdTechies (anonymized). John described it: "The idea behind this is very small-scale repeatable low-support low-cost or no-cost projects involving technology that improve student learning." This internal initiative had a similar objective to the external one that IIIU was involved in called OE Tech. After implementation, the projects were evaluated, and a report was sent to senior management. This program benefited from EEEU's restructuring by hiring people who previously worked at other institutions. They brought in new ideas, experiences, and practices regarding education and educational technology, course topics only offered elsewhere, as well as access to their respective networks (John_CD). In other words, EEEU's ecosystem benefited from the diversity of its species.

These points indicate that The EdTechies was the result of an Adhocracy at EEEU whereby particular values were embraced. These values included change, diversity, and innovation to provide creative solutions to improve students' learning experience.

There was a trace of a Market at EEEU since it had used an external focus to realize a long-term goal to become a national leader in open education, for the benefit of the institution and the students. It also demonstrated a Market by attempting to differentiate itself from other institutions. EEEU branded itself as a university where students could save money, since only open textbooks were used there. Universities in John_CD's country aimed for market differentiation and tried to distinguish themselves, he explained. EEEU was emphasizing three to five strengths, and one strength was being a provider of opportunities and of open education aligned with a strong sense of social justice (John_CD). These points were a rough interpretation of the university's mission, which indicated an interest in contributing to the research community and to the social good.

In summary, at EEEU, it appears that a long restructuring process was hindering an Adhocracy culture, since ideas for projects were not being proposed. However, the small size of EEEU normally favored faster innovation than at large universities. Plus, John_CD's head of department was open to suggestions from the PPP, as were professors when developing courses. Thus, there were characteristics of an Adhocracy at EEEU. Since the EEEU staff valued the relationships they had with colleagues and students and tended to stay at EEEU for unusually long periods, this university had Clan characteristics that appeared to be dominant. A strong commitment to quality of education, the use of low-cost or free and openly licensed textbooks, provision of open education to a wide variety of students, and the ethical treatment of students in addition to a variety of methods for sharing knowledge (annual showcase and the EdTechies) and valuing a variety of perspectives including those from new employees was demonstrative of the Clan. In addition, the intention to differentiate EEEU from other institutions indicates a Market. This organizational culture appeared to be

dominant among administrators. These findings reveal the fluctuations and intentions for the organizational cultures. Despite the multi-faceted evolution of EEEU's organizational cultures, OEP implementation was increasing.

Arena of EEEU

We will now explore EEEU and its development of a course for the OERu by using the Arena framework and referring to Figure 7.2. where the matter pertaining to course design and development at this institution is mapped out. The green circle in this Venn diagram is an ecosystem that includes all the matter related to the OER development by EEEU in its pilot project. The blue dashed oval represents an ecosystem, including the OEP manager and the OERu. This Arena analysis examines the EEEU's organizational and course ecosystems.

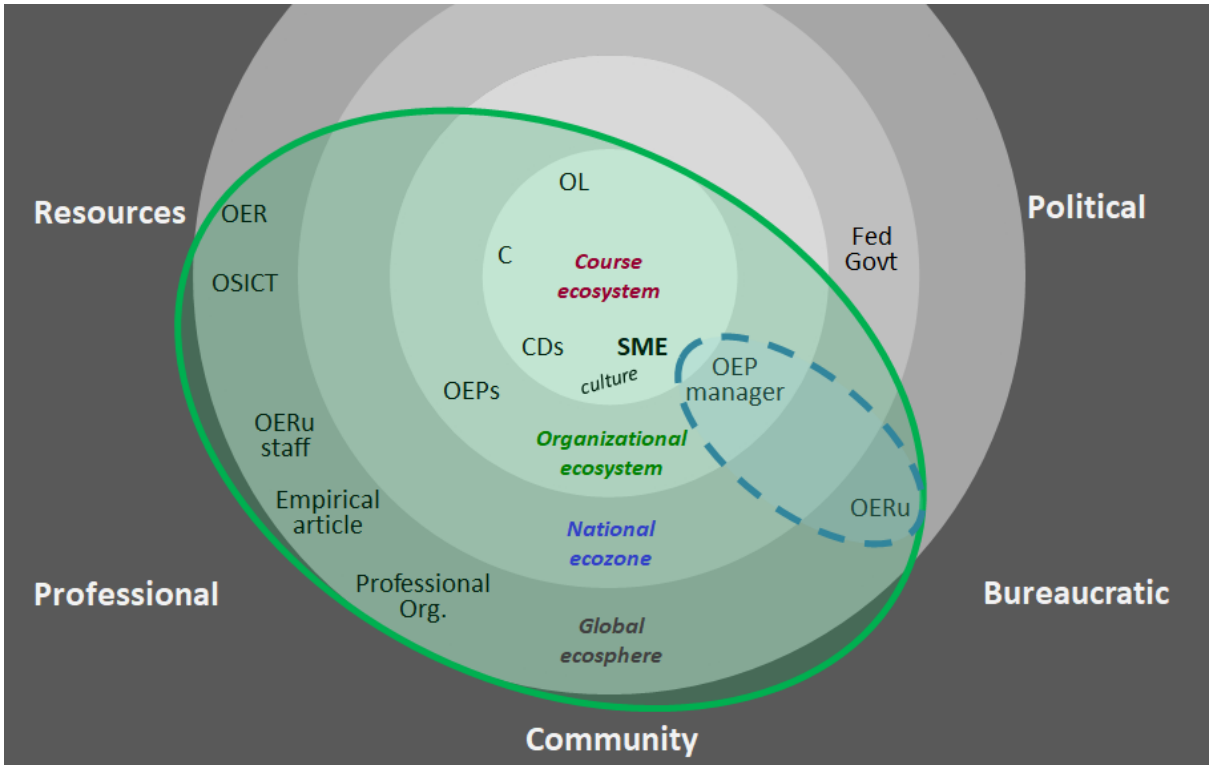

Figure 7.2. Arena centered on EEEU's development of a course.

KEY

Course ecosystem

SME stands for subject-matter expert
CD are course developers
C is the course.
OL stands for open licenses

Organizational ecosystem

OEP manager
OEPs are open educational practices

National ecozone

Fed Govt is the federal government

Global ecosphere

OERu.
Professional Org. was the organization that was called upon to review the openly licensed course that EEEU had developed for the OERu.
Empirical article.
OERu staff.
OSICT stands for open source information and communication technologies.
OER refers to Open Educational Resources

EEEU's open educational practices (organizational ecosystem)

According to John_CD (represented in Figure 7.2. by CD at the time of course development for OERu, and as OEP manager since late 2016), EEEU defined OEP (in the organizational ecosystem in Figure 7.2) as actions that influenced learning and teaching, as with Cronin (2017) and Paskevicius (2017). OEPs were manifested in the creation, use, and sharing of openly licensed content, and there was interested in having more openness in learning and teaching (John_CD). John_CD added,

> It's very much about content at the moment. There are some discussions around open assessment and also around offering open courses. They're still in infancy, if you will. The reason why I see most of it focused on the learning and teaching is because that's the area that's doing most of the pushing.

This quote shows IIIU's interest in educational evolution for online learning.

EEEU did not have an OEP department. Instead, the OEP were diffused throughout the institution, including PPP, which was focused on instructional design (John_CD). This network approach to OEP implementation was reflected in how John_CD connected species with different skills and tasks related to open education to strengthen interactions across the ecosystem community. When people needed information on OEP, he hoped that they would not only know to seek him out, but to seek out others for specific purposes. John_CD felt that a leader who was innovating had the responsibility to set up conditions to eventually make his role redundant. This bridge-building

approach increased the sustainability of OEP in the ecosystem, and would reduce disruptions if any single role or species left the organization, including the role dedicated to OEP.

EEEU's website listed the actions taken by EEEU staff with regards to OER such as using OER in a variety of media, creating micro-courses, using CC licenses, and adapting educational content from other universities to fit the EEEU context. Additionally, EEEU was involved in a project for supporting open textbooks through a Grant for Education (anonymized). The project involved exploring methods for creating and sharing OER and determining ways to make the process of OER development a part of mainstream work. EEEU offered a professional development courses related to open education as well as several open courses for students. Additionally, John_CD's institution offered internally funded grants for professional development. One grant, called OEP Fund (anonymized) was administered through John_CD's department to support teaching and learning projects. There were also grants for professional development and to offer staff awards. These grants could stimulate evolution towards increased involvement in open education. John_CD recommended projects for funding, some of which were aimed at creating open courses.

As these projects developed, staff learned from their experiences to secure commitment from outside of the university to support similar projects. John_CD provided the following example: staff from EEEU collaborated with the regional education department to build two courses for professional development. The projects caught the attention of the federal leader's office. Each year, EEEU held at least one event such as an institutional showcase where staff presented the projects that received that year's grants. The year that the two courses were developed, representatives from the regional and federal governments were in attendance, indicating the formation of a bridge between EEEU and governments at two levels. Afterwards, there was more interest in developing professional development courses in part for internal use and in part for community outreach. This point illustrates the evolution to increasing the numbers of species,

including those outside of the organizational ecosystem and in the community sector. Further support from EEEU for staff to engage with OER and OEP came in the form of services like PPP for course design and development and through the library, for finding, evaluating, and using OER. Often, the training materials were provided with open licenses which offered the possibility for species outside of the ecosystem to benefit. This internal support for OER and OEP engagement demonstrates EEEU's efforts to further is educational evolution.

Instructional design at EEEU (organizational ecosystem)

When asked about how his team conducted instructional design, John_CD responded that, early on, they created books containing course material or serving as study guides. Four years previous to this interview, the university evolved from mailing out books to students to focusing on learning design and consultancy. Eventually, a variety of species would support course development: librarians, educational technologists, an Indigenous perspectives consultant, a manager of educational futures, a program consultant, and other roles related to open education. A similar amount of variety, though with different roles was noted at IIIU. Thus, the organizational ecosystem underwent a major evolution of roles in the professional sector with an impact on how the students would learn: less from books and more from digital resources.

Introduced was backwards design, where a course was designed starting with the learning objectives. Next, the assessments were created, then learning activities and course content (John_CD). The course development ecosystem evolved to adopt this approach for its effectiveness, which suggests that an ecosystem community had self-organized. John_CD and his colleagues used this approach when designing a course for the OERu. The course (C in Figure 7.2.) was designed to be in four parts (micro-courses) with 40 hours each of notional learning. Each part of the course needed to contain at least one meaningful assessment. This was different from EEEU's usual design of three assessments per course. It was also planned that students would receive feedback on an assignment in time to make use of the feedback in the subsequent micro-course. Thus, the micro-courses were

recommended to be taken in a specific order, though students could take them in the order of their choosing as was an accepted practice with OERu courses (John_CD). As with the course developed by IIIU, this course was developed before the OERu had developed its NGDLE. The implications were similar to those for IIIU: social media may have been used in the course, but not using the particular tools that the OERu had adapted, and not in the form of a NGDLE.

Instructional design of an OER for OERu (course ecosystem)

John_CD went on to describe how it was to work in WikiEducator (OSICT in Figure 7.2) to develop a course for the OERu: it was decided early on that it would be useful and more sustainable to have a group work on this project rather than an individual if it was going to become a common practice to use the WikiEducator platform. Thus, a course ecosystem community was formed and composed of John and three other course developers and a subject matter expert who was the keystone species (CDs and SME in Figure 7.2.). This experimental approach was similar to that of IIIU's first course development for the OERu which was a pilot project.

John_CD and his colleagues were used to using a highly customized version of Moodle, so there was a stressor in the form of a steep learning curve for using WikiEducator. Consequently, the four team members decided to meet weekly to resolve issues together - working as a self-organizing ecosystem community - and to use the OERu's discussion forums or live online chats (OSICT in Figure 7.2.) with the OERu CEO and open source technologist (OERu staff in Figure 7.2) for additional support. The open plan physical office space enabled the team members to ask each other questions throughout the week. Thus, the community worked both online and in face-to-face environments.

John_CD and his colleagues aimed to make a visually attractive course with a logical order and grouping of activities, choice of support mechanisms, and sensible navigation. The team within this course ecosystem aimed to break up text with images and directive icons (visually informing the student to write a blog post, submit an assignment, etc.) to avoid being overwhelming to the

student. Many of these ideas were regularly implemented in the courses at John_AD's university. Once his team found ways to use them in WikiEducator, the process became easier to repeat with less energy expenditure, making course development faster and thus evolving towards a more sustainable ecosystem. This point illustrates the importance that IIIU's team attributed to educational considerations.

When asked about other skills required to build courses for the OERu, John_CD answered that it was important to learn how the CC licenses (OL in Figure 7.2.) worked and how they could be combined. To this end, they consulted the OERu CEO and open source technologist via email, who provided explanations. The OERu CEO would also independently examine the course and flag content that had an unsuitable license. Thus, the relationship between the OERu and EEEU communities was bridged by a strong collaboration and regular communication among the species involved. This bridging and resulting two-way flow of energy as information between OERu and EEEU was strengthened by John_CD's involvement in OERu activities. Once the EEEU team had a shared understanding of what the work entailed, John_CD said that they were more comfortable with the project (energy had increased) and were thus more willing to move forward with the evolution towards building an openly licensed course. As the course development progressed, relationships within the organizational ecosystem of EEEU proved vital too. John_CD said that he made use of EEEU's culture of connecting people and developing relationships when building the course. The team also reached out to an organization in the professional sector (Professional Org in Figure 7.2.) whose work was in the same field as the course; the purpose was to obtain feedback in a quality assurance process. This was in contrast to IIIU's consultation of the OERu community for feedback.

One major stressor changed the evolution of the course development: the subject matter expert, who was the keystone species, did not like the presentation format of WikiEducator, which was the platform for course delivery at the time. WordPress later became the course publishing site through

technological evolution at the OERu. Instead, the subject-matter expert at EEEU had the course published on another platform accessible in the global ecosphere with an aesthetic presentation up to his standard.

Since the time that John_CD and his team finished working on the course, he and the subject matter expert were the only people from the team to remain at EEEU; three other course developers had left due to the restructuring. This means that the course ecosystem collapsed. Given this situation, I asked John_CD whether it would be possible for a group of EEEU staff members to assemble to develop another course for the OERu, he responded:

> Absolutely. We have open licensing across the university - especially across our area, the [PPP], and also the library has been a focus where they've built skill very purposefully over the last few years. If someone's got a CC or a public domain licensing query, there are actually quite a number of people who we can point them at.

Thus, a different organizational ecosystem had evolved that could support OER development. However, using WikiEducator was a stressor since it would be challenging to train colleagues to learn the coding process again (John_CD).

7.3. Stressors of IIIU and EEEU

I will examine the stressors that influence IIIU and EEEU's engagement with OER by using Cox and Trotter's (2017b) OER adoption pyramid. The analysis will proceed in the same fashion as described in section 6.3. where the OERu's stressors were analyzed. The discussion about each stressor ends by indicating the location of that stressor on Figure 7.3. according to alphanumerical labels. Some stressors do not relate strictly to OER and are indicated with an asterisk.

The OER adoption pyramid: Access.

Stressor. Barrier: Possible lack of access to infrastructure by students

No interviewee mentioned issues related to access, likely because access is not a concern for IIIU and EEEU located in developed cities. Thus, this stressor is not numbered. If this stressor did exist, in Figure 7.3., it would be located at positions 1.a., 1.b., 1.c., and 1.d.

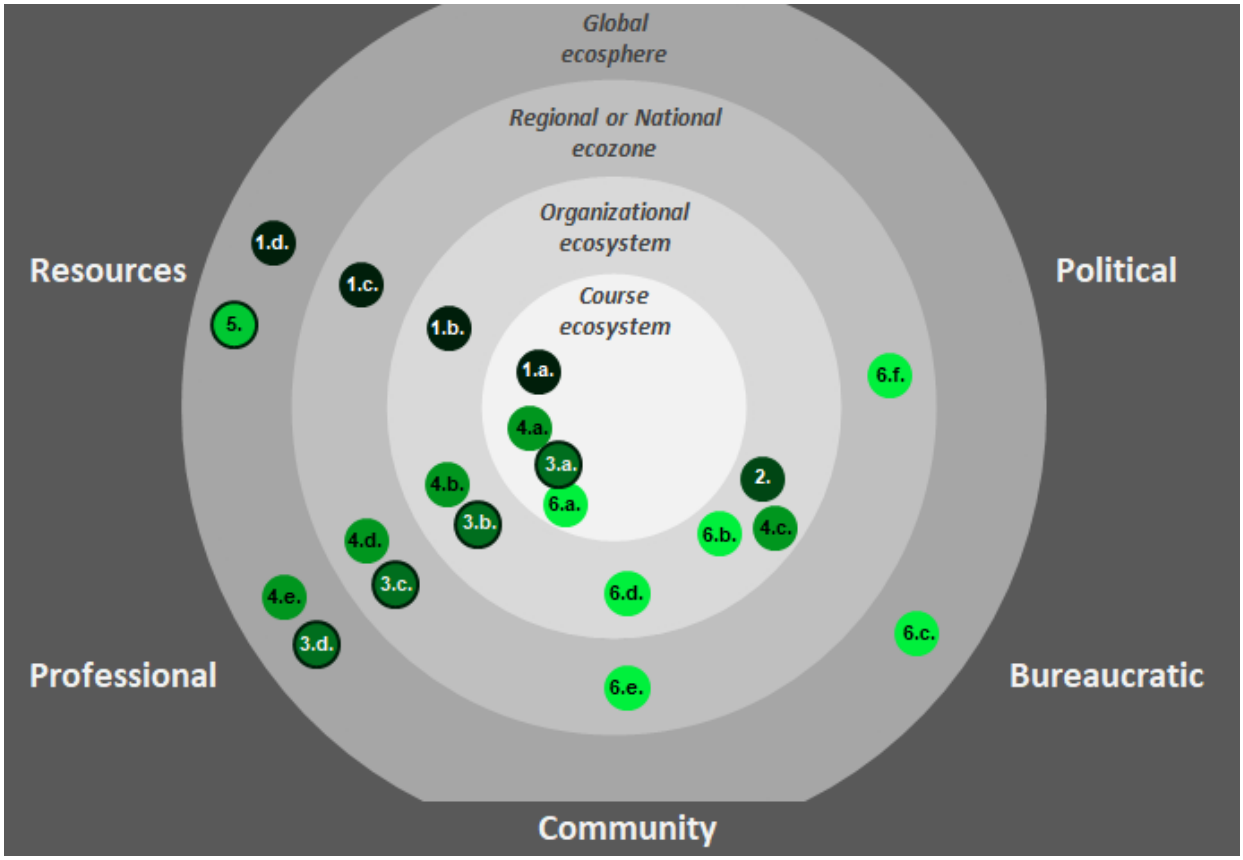

Figure 7.3. Arena displaying the locations of the stressors involved in course development by IIIU and EEEU.

The OER adoption pyramid: Permission

Stressor 7.1. Barrier: Retention of intellectual property rights by the institution

I searched for policies at each institution on intellectual property rights. I also sought out laws on copyright at the federal level and additional publications. To reveal the laws on these topics would reveal information about IIIU's and EEEU's federal governments, and therefore, indicate their locations. What can be revealed is that is that intellectual property rights are held by the institutions, though exceptions can be granted to individuals or for special cases such as the partnership with the OERu. The course produced by IIIU is hosted as micro-courses on OERu's course site, where Stephen, Samantha, and IIIU are recognized as the re-developers of the course. The course produced by John and his team is hosted on a site linked to IIIU, and the attribution for the course is made to two

members of the course development team, though not John, and one of them is the SME. In Figure 7.3., this stressor is located at position 2.

Stressor 7.2.* Barrier: Retention of software license by the institution

John mentioned that it was difficult to update his institution's pages about open education because updates were to be carried out by the holders of a particular software license. Additionally, there could be a bottle-neck in services even if the software license were open, seeing as the university administration wanted to oversee changes made to its publicly accessible pages. In Figure 7.3., this stressor is located at position 2.

The OER adoption pyramid: Awareness

Stressor 7.3. Barrier: Poor perceptions of OER

According to Stephen_AD a barrier to adopting OER related to instructors' perceptions of OERs and the practicality of OER. He believed that commercial resources were valued more than OER because there was a "quality process in place for commercial textbooks" he said, expressing not his view, but rather a perception that others held. As for Trevor, he believed that there were low barriers to getting students working on assignments and sharing them openly, but there was still skepticism. Trevor thought it would take a critical mass of supporters for open education to gain prominence. In Figure 7.3., this stressor is located at positions 3.a., 3.b., 3.c., and 3.d.

Stressor 7.4. Enabler: Increasing awareness about OER and OEP

John_CD explained that at his university, innovations for teaching and learning were welcome and could be presented at an institutional showcase. Government representatives attended one of these showcases and reported back to the federal leader's office. One consequence was to stimulate other staff members' thinking about ways to reach the community and publicize their work. This finding shows the potential value of community outreach and exposure of innovations within an institution. In Figure 7.3., this stressor is located at positions 3.a., 3.b., 3.c., and 3.d

The OER adoption pyramid: Capacity

Stressor 7.5.* Barrier: Building capacity of delivering innovative courses

Wanda described the challenges she had in managing the feed of posts that emerged from the aggregator in the course that she developed and facilitated in partnership with the OERu CEO. She noticed that the feed revealed posts in a format that seemed chaotic since sequential posts did not always immediately follow each other. She managed this issue by summarizing posts to reduce students' stress. In Figure 7.3., this stressor is located at positions 3.a.

Stressor 7.6. Barrier: Structural barriers

There are some structural or organizational barriers to innovating in tertiary education. For example, Trevor described the structural barrier of innovating in online courses where the course development process can take two years and involve 20-30 people. In contrast, he described the ease of innovating in a classroom and obtaining feedback from students quickly. Thus, co-evolution can occur slowly with highly organized systems. The OERu's approach to course design was agile and therefore could circumvent some structural issues. In Figure 7.3, this stressor is located at position 4.b.

Samantha mentioned another structural barrier: the silo effect that separated departments and inhibited sharing materials at IIIU. At EEEU, there were active efforts to connect staff across departments and institutions; in John's role as OEP manager, he was a bridge connecting species across ecosystems, ecozones, and with the global ecosphere. He was also a bridge builder since he made it his role to connect species from different ecosystems (library, IT, faculty, etc.) within his organization and across organizational, regional, and national ecosystems. Thus, one may overcome stressors such as structural barriers by inserting into the system species who are highly skilled with respect to OER and OEP with a role devoted to connecting other species. In Figure 7.3., this stressor is located at position 4.b.

Stressor 7.7. Barrier: Major disruptions to the system

Since my last interview with Stephen, he and Samantha retired. Stephen, as a keystone species, worked in anticipation of this disruption. He had provided a large flow of energy over several years

and built up a team of twelve people of various species who could continue developing courses for the OERu. After his departure, the system remained stable and the OER development could continue. However, at EEEU, the restructuring had mixed results. Several course developers left, as did some executives who were keystone species as well as bridges with the OERu and advocates of OER. The change in leadership slowed innovative projects for several months. This is an example of devolution of an ecosystem. In Figure 7.3., the stressors of the departure of a keystone species and of course developer species are located at 4.b., and the stressor of the long-term restructuring at EEEU is located at 4.c.

Stressor 7.8. Enabler: Staff knowledge and skills

At both IIIU and EEEU, there was a variety of species with skills (stored energy released during production) for building and licensing OER. Hood and Littlejohn (2017) added to these skills those necessary to modify or remix OER for their intended use. To enhance professional development, Karunanayaka and Naidu (2018) suggested that participants in PD sessions keep reflective journals to enhance their learning, as mentioned in discussing Stressor 6.9. Hood and Littlejohn (2017) similarly recommended that faculty learning to use OER write reflections regularly to better transfer their knowledge to practice. This approach was aligned with the findings of Kaatrakoski et al., (2017), who suggested facilitating the transfer of knowledge to practice so that the participants of PD could "negotiate new meaning associated with their personal experiences" (p. 611). This point by Kaatrakoski et al (2017) is significant to this research because it highlights a particular reason that PD on OER may not be effective enough to spread fast: it needs to be made clearly relevant to faculty, and it needs to be shown to respond to a need that these faculty have. Thus, reflection helps to bridge theory and practice, and observation of applying theory to practice stimulates reflection in a cyclical learning process. This is an example of co-evolution. Hood and Littlejohn (2017) expanded on this process of learning about OER:

> Any attempts to increase the use of OER and OEP by adult educators will require learning opportunities that facilitate the construction of theoretical and conceptual

> knowledge, as well as learning that is embedded within the practice, and contexts – social and situational or instructional – within which educators work (p. 20).

This quote summarizes the complexity of learning about OER and OEP and touches on various professional development processes involving species and matter within organizational and classroom ecosystems.

As an OER user goes from a novice to an expert, the focus shifts from learning about licensing and technical issues to learning about adapting OER to suit pedagogical requirements or a shift from their own learning to their students' learning (Hood & Littlejohn, 2017). Eventually, the students learn enough about OER that they cause their instructors to learn more (Hood & Littlejohn, 2017). Thus, species within the classroom influence each other and cause this ecosystem to evolve. Kaatrakoski et al. (2017) also indicate that faculty are influenced by their professional networks, and that those who are more conventional make it more difficult to change and open up their practices. This point highlights the need for a change of culture if engagement with OER and OEP is to be successful and is supported by Rolfe (2012). Indeed, Kaatrakoski et al. (2017) state: "Where there are fundamental changes in practice (from conventional teaching to OEP) and the tools being used (from traditional learning resources to OER), approaches to organizational change management become critically important" (p. 611). This statement resonates with my research in showing the importance of organizational change when introducing new educational technology. In Figure 7.3., this stressor is located at position 4.b.

Stressor 7.9. Enabler: Active participation of individuals in open education activities while holding a leadership position

Samantha and Stephen were enablers of open education since they were advocates for it, and gave up personal time to develop a course for the OERu. This work fulfilled its role as a pilot project as Stephen_CD described it, but it was not sustainable; it did not allow for balance within the ecosystem. Given that Stephen_CD was so strongly involved in the work as a course developer, he

understood the problems at hand. He was able to take rich knowledge about the course ecosystem and use his role as a keystone species to stimulate self-organization within the organizational ecosystem. Such practices are encouraged for institutional change to increase OER and OEP engagement (Otto, 2019). In short, he was a very strong bridge between both ecosystems and put that role to use. That is, he was able to have the coding work assigned to the species of IT support and was able to have development of courses for OERu made a part of instructional designers' regular workload so that they would no longer need to work in their personal free time on such projects. Thus, he reduced their stress. Another result was that the IT support staff enjoyed the increase in variety of their work when they started using WikiEducator coding. Thus, Stephen_CD enabled the course and organizational ecosystems to evolve to a sustainable state for building courses for the OERu. In Figure 7.3., this stressor is located at position 4.c.

As for John, his leadership role in open education enabled him to connect people from departments across the university to enhance collaboration and strengthen working relationships within the institution. His role also allowed him to propose, participate in, and support initiatives such as professional development courses using open platforms. As a keystone species that bridges multiple ecosystems, he could counter some of the structural barriers of Stressor 7.5. In addition, John's involvement in selecting projects to receive grants (energy) for open education projects directly stimulated co-evolution. When the resulting projects were showcased within his institution, they had the potential to lead to new connections within the organization. When representatives from the national ecozone and the global ecosphere participated, there was the potential to stimulate co-evolution if they resulted in opportunities for change in education or technology. In Figure 7.3., this stressor is located at position 4.c.

Stressor 7.10. Enabler: Professional development offered through regional or national networks

IIIU's vignette demonstrated that SSS played a strong role in building bridges across organizational ecosystems in its regional ecozone and supported mutualism in a variety of ways. This stressor is located at position 4.d. in Figure 7.3.

Stressor 7.11. Enabler: Personal contacts in professional networks

An enabler that is more informal than the approaches described above is to learn from other people and institutions about open education. Trevor mentioned the effectiveness of informal networks using social media and personal contacts at professional events. He elaborated that these networks have been built up from previous work experience at other institutions and that they could serve to share resources, solve open source code problems, or other issues. Sometimes, the help received was greater than expected, as in this example, described by Trevor:

> I've two years in a row and hopefully a third year in a row visited [Friendly] University around the same time as their OER conference that happens in the UK every year and I hope to do it again this April. We were running Moodle and there was this one particular functionality that was going to be deprecated in the latest Moodle upgrade and we were looking at having to go back over 300 courses that we had already built in there that depend on this functionality, which was going to be a nightmare. […] there is this plugin that might allow us to keep going, but the plugin has been abandoned by the developers. Then we found out that, for a related plugin, there had been people at [Friendly University] who had done some development of a related plugin. So we just sent them an email asking, "Are you aware of this?" or "Do you have any tips?". […] And then within 24 hours, they'd taken on the plugin and updated it to the way it needed to be and made it viable again and saved us - I can't even think of how much time. And that was just happening on a collegial, friendly level.

Different types of networks can be beneficial for their financial, training, and resource support such as the regional network that IIIU and SSS were a part of. Thus, connectedness of various species across institutions through social media and personal contacts could enhance capacity and help to maintain balance in the system and keep it in a steady state. In Figure 7.3., this stressor is located at position 4.d. for regional inter-institutional networking and 4.e for international networking.

While networks can help for educational technology in general, it may be more difficult to build relationships with people and institutions working on OER. Stephen_CD explained that there was no Community of Practice at his institution when he began working on OER, but it built up under his

leadership at IIIU. On the global scale, Stephen_CD said that he did not access the WikiEducator community much and did not obtain a great amount of feedback from the community while developing a course. Even though the amount of feedback was low, Samantha was deeply grateful for it and felt it was useful in increasing the course quality. Stephen_CD indicated that a finding in his own research was that it would be beneficial for developing courses for the OERu if there were a stronger CoP. These findings are significant in terms of the value of adopting organizational cultures across the OERu network that favor collaboration, particularly when working on educational innovations. The OERu CEO has indicated that the OERu is a low-risk area for innovation, which means that an environment was provided for collaboration. An open platform therefore seems to require additional actions to nurture a strong and collaborative network as recommended by Schreurs et al. (2014). In Figure 7.3., this stressor is located at position 4.e.

The OER adoption pyramid: Availability

Stressor 7.12. Barrier: Rarity of OER with a particular license or format

At IIIU, it was a stressor for the course developer species to find OER with the type of licensing required by the OERu: CC-BY and CC-BY-SA. A compounding stressor was that species within the institution tended not to know how to use CC licenses. It was also a stressor to have to adapt materials that were published as OER, but were in a format that was difficult to edit or adapt. There were moments where they had to search extensively or develop content from scratch so that their course could meet the OERu's licensing requirements. In Figure 7.3., this stressor is located at position 5.

Stressor 7.13. Barrier: Rarity of OER on advanced or narrow topics

Samantha remarked that it was difficult to find OER (matter) on specialized or advanced topics. For this stressor, the production of OER depends on species deciding to create OER. Consequently, this stressor could be placed in the category of "Volition" in the OER adoption pyramid. It is placed here because this point is from the point of view of species who were borrowing OER created by others. In Figure 7.3., this stressor is located at position 5.

Stressor 7.14. Barrier: Lack of comprehensive OER courses

Stephen_CD noted that it was rare to find OER that came as turn-key solutions (complete with overheads, exams, and lesson plans). In contrast, Rory explained that often, commercial resources were packaged with all of these resources included, making them more attractive than OER. In Figure 7.3., this stressor is located at position 5.

The OER adoption pyramid: Volition

Stressor 7.15. Enabler: Personal initiative

A point that arose with all interviewees at IIIU was that the core of the will to fulfil a commitment was the personal initiative to complete courses and to develop sustainable practices at an institution for future course developments. In Cox and Trotter's (2016) analysis of agency with regards to OER engagement, they arrived at a similar understanding. They explained,

> At UCT, the role of agency is paramount in scholars' OER activity. Indeed, most scholars suggest that the OER-friendly policies that exist at the university do not act as a motivating factor for OER adoption, but are merely a hygienic factor. They create the conditions necessary for OER contribution, giving them the legal freedom to share their teaching materials as OER, but they state that this fact, in and of itself, does not motivate them to actually do so. It is, or would be, their ultimate concerns which include internal moral and educational philosophies that drive them to make such efforts (Cox & Trotter, 2016, pp. 157-158).

While OER-friendly policies and organizational support were not found to motivate individuals to engage with OER, they were found to be helpful (Coughlan et al. 2019; Rolfe, 2012). In Figure 7.3., this stressor is located at position 6.a.

Stressor 7.16.* Enabler: Internal funding dedicated to OEP

At EEEU, internal funding (energy) was available for projects involving OEP. However, it is not clear how projects were sustained in the long run, and whether the projects were monitored for sustainability and impact. The completed projects were presented during an organizational showcase. This event nurtured interaction, inspiration, provision of feedback, and bridge formation across organizational, regional, and national ecosystems. All of these actions can stimulate evolution. In Figure 7.3., this stressor is located at position 6.b.

Stressor 7.17.* Enabler: Consequence of producing courses as an OERu partner

A motivation for staff at IIIU and EEEU to produce courses for the OERu was a will to honor their commitment to do this work as OERu partners. At IIIU, the commitment to build the first course was purely personal as the course developer species worked on their free time to complete it. Once this course was done, they were able to obtain institutional support to complete the work in less stressful ways. Thus, the process began with personal volition to adopt OER and became a process based on personal and institutional volition. In Figure 7.3., this stressor is located at position 6.b.

At EEEU, the inverse occurred: course development for the OERu was supported by the institution since the course developers were granted work time to complete this work. The first course was completed, but the SME (keystone species) decided to publish it in a platform other than WikiEducator because he was not satisfied with the aesthetics of this platform. A second course was proposed by a course developer, but the institution was in a period of restructuring, and so could not proceed (John_CD). Thus, EEEU went from having both institutional and personal volition to develop OER to having only personal volition to do so. These two examples demonstrate how different parts of an educational system affect each other. In Figure 7.3., this stressor is located at position 6.b.

Stressor 7.18.* Enabler: Alignment of mission with OERu and OERu's other Partner Institutions

Samantha and Stephen mentioned IIIU's government-legislated mandate to promote flexible education. Trevor believed that the alignment of mission, vision, values, and goals between the OERu and IIIU helped in the advancement of certain projects. When IIIU wanted to move forward with a project that happened to involve the OERu, the justification that the work was for the OERu helped to obtain approval. Trevor added,

> I think it's actually informed our vision in that sense. I think it's sharpened it, given us language, and given a sense to allow us to align what we want to do with what other open institutions around the world are doing.

At John's university, this alignment of the vision and mission with those of the OERu existed as well. Stephen had a different take on IIIU's involvement with the OERu in that IIIU's senior administration valued participation with the OERu in terms of reputation and potential growth. EEEU's senior administration often attended both the OERU international partners' and Council of CEOs meetings (e.g., http://wikieducator.org/OERu/OERu_16.10_Meeting/Confirmed_participants). This shows that the senior administration valued the OERu's work enough to attend their meetings. Stephen_AD elaborated on the administration's positive view on IIIU's partnership with the OERu and other OERu member institutions:

> Being a partner in the network gained recognition for our VP Academic and president when they went to the annual OERu meetings and met their counterparts around the world who were impressed with what we were doing. Partnerships through the member institutions was just starting to develop when I left, when we were looking at combining our courses for program design.

Trevor corroborated the acknowledgement of IIIU's senior administration of the benefits of participating in the OERu's work. According to him, they saw value in the international nature of the collaboration, strong representation from various world regions, and the involvement of great institutions. Thus, when Trevor proposed projects involving the OERu, they were approved more easily. Trevor supposed that this was also because of the strong alignment between the values and mission of IIIU and the OERu. Trevor expected that expanded involvement of IIIU in the OERu's work would provide IIIU with "access to a network of expertise around OER, open policy, open technology, that will continue to be useful to us". Trevor added that IIIU would be doing this kind of work even if it were not a member of the OERu; membership in this network simply provides an additional motivation.

To summarize this point in terms of the Arena, the OERu had a symbiotic, and more specifically, a mutualistic relationship with both IIIU and EEEU. The benefit for IIIU has been to learn from the OERu to more clearly define its mission and vision. In addition, when a member of the Exec species

wanted to propose a project for open education, it was beneficial to refer to its partnership with the OERu. Another benefit was that Exec species at IIIU saw value in participating with the OERu in terms of reputation, potential growth, and global involvement in tertiary education with strong partners. The Exec species demonstrated that they stood by these beliefs by spending time and money (consuming energy) to participate in OERu meetings. In Figure 7.3., this stressor is located at position 6.c.

Stressor 7.19. Enabler: Students' advocacy for open textbooks

Students played a strong role as advocates for OER in several regions and institutions (Rory, Stephen, Samantha). The result of this advocacy was for the institutions to engage more strongly with OER and provide open textbooks to the students. Thus, students provoked evolution such that more OER were being produced. In addition, OEPs were spreading in those institutions. These actions are examples of personal and institutional volition to adopt and create OER. In Figure 7.3., this stressor is located at position 6.d. for influence over the institution and 6.e. for influence over regional or federal government.

Stressor 7.20. Enabler: Little involvement by the federal government

In the national ecozone of IIIU, there was little involvement by the federal government. When there were federally funded projects for distance education, they required representation from all regions of the country so that no particular region could dominate the project. In the past, Trevor explained that there was an imbalance in representation that may have dissuaded the federal government from funding such projects. This stressor is mostly a benefit, as Trevor saw it, since he expressed that this absence of engagement with tertiary education institutions allowed for more freedom and independence. Thus, the keystone species at the regional level who provided funds (energy) to the institution, and the keystone species at the executive level of the institutions had a far more important role in managing their ecozone and ecosystem, respectively than the federal government. Trevor also thought that the federal government's involvement could be a positive stress by providing funds in larger sums than were regionally available to help resolve issues that were a

concern for all universities in the country, such as online security and identity validation of students. In Figure 7.3., this stressor is located at position 6.f.

Superposition of the stressors and matter onto IIIU's and EEEU's Arena diagrams

Having examined the stressors of both IIIU and EEEU, it is worth exploring the vignettes of both institutions in terms of the interactions among their matter and stressors. The matter of IIIU is shown along with the stressors (Figure 7.4) as is the matter of EEEU (Figure 7.5). The four stressors related to Access (1.a. – d.) are roughly aligned with the matter of OER, the course, (C) and the open licenses (OL). The relationship is one of the stressors inhibiting access to the matter. Species at each level can be affected, though ecosystems and keystone species in the national or regional ecozone such as internet providers and the government and its officials can influence access to internet infrastructure. Species within the organization can influence how internet connections are provided (wireless, cable), and where in the institution it is available (e.g., classrooms, library, study halls). Within a classroom, a faculty member can promote internet use in learning activities or attempt to reduce access with rules. For off-campus students, access can depend on laws at any government level, services provided at any level, and on the ability to access the internet at home, free local centers such as a library or community center, or at commercial centers like a café or shopping center.

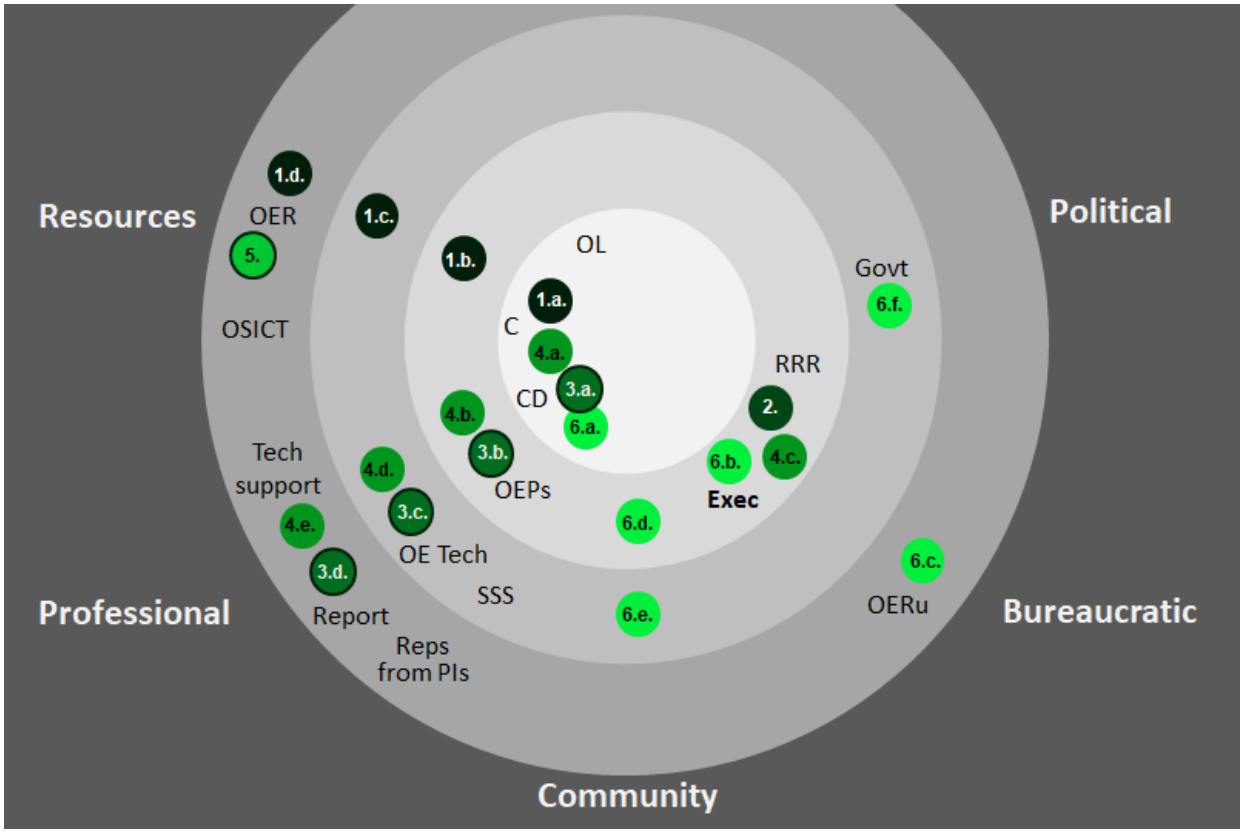

Figure 7.4. Arena of IIIU's matter and stressors

The stressor of Permission (2.) is roughly aligned with the keystone species of IIIU and with RRR in Figure 7.4 and with the OEP manager in Figure 7.5. The significance is that Exec, RRR, and the OEP manager may have some influence in negotiating for faculty or the institution to hold intellectual property rights regarding courses. Faculty would also have influence given that both IIIU and EEEU allow faculty to ask for the IPR of the courses they develop.

The stressors of Awareness (3.a. – d.) are aligned with the role of course developer, with institutional OEPs in both diagrams, with OE Tech (regional inter-institutional collaboration) and Report in Figure 7.4 and with Empirical article in Figure 7.5. Species in the roles involved can all promote or become aware of OER, though course developers are in the best position to increase awareness about the course they are building, and Representatives from PIs can promote awareness of OER globally, and most immediately within the OERu network through OERu channels. Implementation of OEPs

promotes awareness within the organization's ecosystem and by extension, in the courses where they are applied. Communities like OE Tech and SSS can promote awareness regionally, and reports and empirical articles can promote awareness globally if they are distributed online and made available through open access.

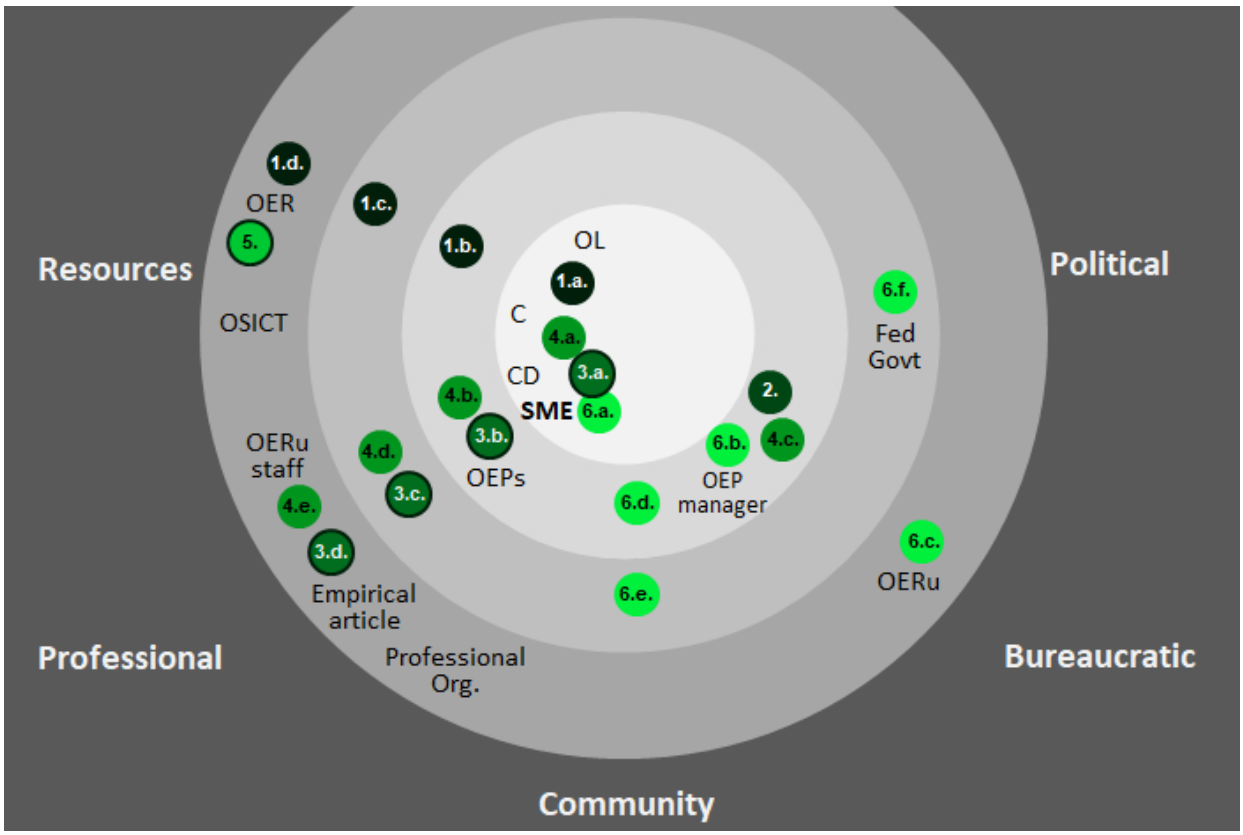

Figure 7.5. Arena of EEEU's matter and stressors

The stressors of Capacity (4.a. – e.) are at all levels of the professional and bureaucratic sectors of the organizational ecosystem. They are intentionally placed closer to the Resources sector than the Awareness stressors. This is because Capacity involves working more closely with OER and other resources such as open source tools than Awareness does. Given that faculty have a considerable amount of control over Capacity factors, they can use their judgment and resources to decide how to best engage with stressors at this level. The OEP manager facilitated bridge building across his institution to enhance capacity building. Stephen and Samantha supported species in various course

development roles to the same end. In short, capacity development was supported effectively by species who had directly been involved in OER development and were active and influential within the organizational ecosystem.

The stressor of Availability (5.) is in the Resource sector in the global ecosphere. Engagement with this stressor involves decisions by individuals or organizations to produce OERs on particular topics and in different repositories or online locations. Species interested in availing themselves of OER must search through OERs according to criteria for content, quality, context, etc. This point must be considered when deciding whether to look for OERs or to adopt or adapt, or to create OERs. Stressors of Volition (6.a. – f.) are scattered among the Professional, Community, Bureaucratic, and Political sectors because species in all of these areas can influence or participate in OER and OEP engagement. Volition involves the choice to volunteer one's personal time, as Stephen and Samantha did. Thus, stressors at this level can stray from the professional sector into a more personal one, which was my intention in locating stressor 6.a. between the professional and community sectors.

7.4. Conclusion

In this chapter were presented vignettes which were cases of two OERu Partner Institutions that had each developed an openly licensed course for the OERu as well as implemented additional OEPs. The three sub-guiding questions were answered.

- **What is the typology associated with the organizational cultures of IIIU and EEEU?**

Indications show that IIIU and EEEU were characterized by a Clan and an Adhocracy among course developers, and by a Market among executives planning for market differentiation or business models for open education.

- **How are the IIIU and EEEU implementing OEPs, particularly for instructional design and development for open education?**

The Arena framework provided a structure to assist in better understanding the relationships among matter within IIIU and EEEU's ecosystems with regards to open educational practices. IIIU and EEEU both developed an openly licensed course, as well as implementing additional OEPs in accordance with their strengths and vision and in alignment with OERu's vision. Following the development of a course for the OERu, IIIU increased its production and accreditation courses while EEEU focused on developing its OEP internally and in partnership with international open education organizations. The OER champions at IIIU and EEEU each made the most of their roles to contribute to open education.

- **What are the stressors involved in OER engagement and OEP implementation and how do they influence these processes?**

The Arena extended by the OER adoption pyramid facilitated an understanding of how stressors could be categorized and of their role in influencing OER and OEP engagement by IIIU and EEEU. There were no Volition stressors reported. Access stressors exist and generally inhibit faculty from owning the IPR of their courses. Awareness stressors include poor perceptions of OERs and an increasing awareness of OER and OEP due in part to the actions of the participants in the current research. Capacity stressors include various influences at different levels of IIIU and EEEU's

respective systems on professional development for OER engagement and OEP implementation. Availability stressors related only to OER and related to a lack of OER on narrow topics, with specific licenses, or packaged as comprehensive resources. Volition stressors related to OER, OEP, and the OERu highlighted how students, faculty, and institutions can influence involvement in open education work. Diagrams where stressors and matter were combined further developed an examination of their relationships. The resulting knowledge can help to choose stressors to address for enhancing educational change with OER and OEP and which matter to involve including keystone species. Findings from IIIU and EEEU shaped this understanding and highlighted particular species and organizations that could facilitate OER and OEP engagement at in particular ways different levels of the OER adoption pyramid.

Chapter 8. Discussion and conclusion

The intention of this chapter is to take a broader perspective of the findings in relation to the three guiding sub-questions. Throughout the discussion (section 8.1), I make recommendations based on the findings. The discussion examines the cases of OEP at the OERu, at IIIU and EEEU and the associated stressors. These topics relate to the second and third guiding sub-questions. They also relate to the problem and purpose outlined in chapter 1 by resulting in models to guide OEP implementation. The models involve the application of the Arena to ecologically and holistically analyze matter related to OEP implementation in all its complexity based on a pilot project. The models also involve the Pyramid extending the Arena to analyze the stressors within the system to facilitate decision-making regarding further OEP implementation. Following these discussion points, I'll explore the topic of organizational cultures at OERu, IIIU, and EEEU. This topic corresponds to the first guiding sub-question and illustrates how OEP implementation can be shaped by the organizational cultures of a given institution. In section 8.2, I answer my research questions with conclusions based on my findings and discussion. I will explain my contribution to knowledge about open education in tertiary institutions in section 8.3 while highlighting the significance of the work as well as the impact and relevance of applying it. These points are followed by the limitations of my work (section 8.4) which feed into my suggestions for future research (section 8.5). I conclude with a thought on why and how open education innovations contribute to society (section 8.6).

8.1. Discussion

This discussion begins with an examination of the OERu's case of OEPs as explored in Chapter 6 and the cases of OEPs of IIIU and EEEU as explored in the vignettes of Chapter 7. Following these sub-sections is an overview of the OERu's stressors and the combined stressors of IIIU and EEEU based on tables in Appendices 9 and 10. The final topic in the Discussion is an overview of organizational cultures of OERu and IIIU and EEEU. A summary of the main discussion points will be provided before moving on to section 8.2. My contribution.

OERu's implementation of course design, development, and delivery

In this thesis, I have explored the case of a radically open organization, the OERu, and how Partner Institutions implemented OEPs. The concept of "open" is complex and comprises multiple dimensions of openness simultaneously. This research demonstrated that in some cases, institutions only reached an understanding of "open courses" after developing an open course. This research has also demonstrated that it is the evolution of the process of design, development and delivery, and encountering the multitude of issues and opportunities that emerged as stressors that led to openness. The structure of this discussion topic roughly follows that of Chapter 6, in exploring the OERu's foundational resources and Wanda's anecdote before exploring the LiDA course.

The OERu had a vision of openness which they communicated through resources and guidance for OER development. However, it was a challenge to balance flexibility and guidance given the diversity in knowledge and experience of Partner Institutions. While some institutions and course developers (John and his colleagues at EEEU) preferred more direction, others found the flexibility to be enabling (Stephen and Samantha at IIIU).

My findings showed that PIs and individuals took on initiatives such as defining, examining, and developing open pedagogies themselves. Wanda did as well, when adapting her course facilitation style to the technologies in her micro-course as an example of co-evolution. While the OERu could provide guidance, it was logical that PIs look to each other and beyond for support since the OERu had limited staffing and its own priorities. PIs and individuals interested in developing pedagogies for open education should examine the learning outcomes of the course in question and then determine how open pedagogy can be of use in whatever form it takes. Examples are OER-enabled pedagogy (Wiley, 2017), group-based problem solving with other online learners, examination or curation of online resources, etc.

In the current research, courses for the OERu were self-directed or had open boundaries. These concepts and those of open and distance learning were familiar to the highly experienced participants in this research. However, for some educators, such concepts are new, as are the concepts of networked learning and reliance on student-student interactions (Otto, 2019) and pedagogies for unknown students. For example, there were Wanda's scaffolding techniques which were useful for unknown students from diverse global locations. They had much in common with the principles of Universal Design for Learning (UDL) (CAST, 2020) which are recommended for any course. Thus, professional development (PD) in open pedagogy and UDL should be offered to those new to teaching in open environments. Further, open pedagogies should be refined based on disciplinary contexts (Otto, 2019).

This PD can take the form of directly collaborating with the OERu as occurred in Wanda's anecdote and in my observation of LiDA103. Course developers from EEEU also sought PD from the OERu in their course development. In these three situations, individuals were experienced in elearning. They expanded their knowledge and skills regarding open education by participating in the design, development, or delivery of an OERu open course. Thus, when beginning to build open courses for open environments, I recommend examining one's current practices and identifying those that support students' high attainment. Further, beginners should consider collaborating with a person experienced with open coursers to develop and deliver a pilot course. Using an ethical approach, where students are informed at the beginning that the course is being tested as a pilot, course designers should experiment with various techniques – within reason and while avoiding overwhelming the students. The outcomes should be documented and used to inform further course improvements. Anyone who applies such experimental projects should share their observations with other open educators either informally through networks or formally in publications – again, after having obtained relevant ethical approvals.

For course design, a useful approach was the OERu's crowdsourcing of curriculum ideas when planning the LiDA course. Its effectiveness was consistent with a similar approach for compiling techniques for online teaching (Dunlap & Lowenthal, 2018). Similarly, during the LiDA online meeting, participants contributed ideas during the approximate ten minutes when they were invited to comment on the proposed course structure. Thus, it was surprising that the OERu did not rely more heavily on these techniques. In contrast, posts requesting feedback in the discussion forums about the development of LiDA did not elicit many responses, though these forums were used regularly by the OERu. A possible explanation is that the OERu CEO was pre-occupied with managing the development of the MVP; the only realistic means for obtaining feedback may have been to use a discussion board. Considering that the OERu promoted collaboration and open design and open development, processes such as crowdsourcing and collaborative design in online meetings seem aligned with its intentions. As well, Steiner (2016) indicated the value of diversity in ecosystems; crowdsourcing and meetings with open invitations to collaborate on development are respectively, asynchronous and synchronous activities that can attract highly diverse professionals. To contribute, they need an opportunity and agency. Consequently, I recommend further crowdsourcing and collaborative meetings where individuals are invited to contribute to course development. In this fashion, they would be empowered to develop learning activities, assessments, and apply learning theories, among other tasks. At the same time, they can build their knowledge and skills about OER development. Activities that promote collaboration and interaction among PIs are recommended.

A further point to consider in course design is the culture, according to the Arena framework. I am not referring to organizational culture, which will be explored in a later section of this discussion. Rather, the focus is on the class culture composed of the national culture and the individual habits of all species in the course ecosystem. In networked learning environments such as open boundary courses, students from any culture may participate. This practice has important implications for course design. Indeed, the learners' cultures influence their volition to engage in learning in open

environments, as per Cox and Trotter (2016). Culture can also influence a student's retention. One reason is that students from high-context cultures (HCC) (who tend to communicate through indirect, implicit, and non-verbal means and who favor long-term relationships) have a lower retention rate than their low-context counterparts (Bozkurt & Akbulut, 2019). People from low-context cultures tend to communicate in direct and clear ways, rely on written communication, and easily form short-term relationships. To increase retention of HCC students, it was recommended that facilitators welcome them and nurture their engagement so that they become more active in the network (Bozkurt & Akbulut, 2019). In a course where there are no facilitators, this task may need to be completed by alternative means. Options are to use open source software or to design activities or provide a welcoming message and instructions that encourage participation of students from both high- and low-context cultures.

Open courses are one solution for those excluded from traditional tertiary education systems. However, even the best and lowest-cost access to OER will not guarantee that everyone obtains an education. Other factors that limit the completion of tertiary studies are at play (e.g. Brown & James, 2020). Thus, the role of access should be acknowledged as one part of a system to support those who want to obtain a tertiary education. While acknowledging that point, each PI could examine how it can best contribute to enabling prospective students to obtain an education. As mentioned in the discussion of Chapter 5, PIs should look towards each other and the academic community for inspiration, and examine what they can do to evolve education. To this end, they should conduct an Arena-and-Pyramid-based analysis with OER design, development, and delivery as part of the course ecosystem. The course ecosystem should include the intended students: low-income students, under-represented students, refugees, etc. The whole system should include the species and matter required to assist the students in a course ecosystem as well as relevant matter in the higher levels of the system. The examination of both the system and its stressors can proceed once the system has been defined.

Open educational practices implemented by IIIU and EEEU, with reference to the OERu

Based on IIIU and EEEU's engagement with OEP, I will offer indications of the types of actions that support successful OEP implementation and provide recommendations to further enhance OEP implementation. This recommendations relate to the following points: OEP as processes to facilitate access to tertiary education; regional, national, and international partnerships related to OEP implementation; processes for OER development, consideration of privacy and ethical issues in OER development, the long-term impact of pilot projects of OER development, and the leader-like actions people can take to enhance OEP implementation regardless of their position.

PIs can work with the OERu in different ways to provide open education. IIIU and EEEU had been implementing various OEP for years to facilitate prospective students' transition into tertiary education and to recognize their prior learning with academic credit. They also had highly diverse roles dedicated to course production and student support services within the university. Beyond these commonalities were some differences. IIIU seemed to focus more on development and accreditation of OER as courses, and EEEU seemed to focus more on implementing OEP as teaching and learning practices. All of these processes aligned with the OERu's aspirations to provide education to all. Additionally, the long experience and organized processes of IIIU and EEEU enriched the OERu's knowledge base. Thus, there was some alignment of values and practices among the organizational ecosystems as well as some specializations. Based on these findings, each PI should identify all of the diverse roles at their institution related to education. They should highlight their strengths, weaknesses, and interests related to engaging with OER and implementing OEP. They should use the Arena framework extended with the OER adoption pyramid to analyze how they engage with OER and OEP and to identify the related stressors. With this information, the PIs may be better able to plan for both OER and OEP engagement within their institution. They may also be able to inform the institutions in the OERu ecosystem of the value of diverse roles in OER and OEP engagement.

In open education initiatives, IIIU and EEEU formed partnerships with organizations at regional and national levels. IIIU saw no involvement of its federal government at any stage, while EEEU did. IIIU collaborated strongly with regional organizations in a give-and-take relationship with mutual benefits for skills development, knowledge sharing, and relationship building. Meanwhile, EEEU collaborated with international organizations on open educational projects. However, the benefits of EEEU's partnerships were not clear, aside from the promotional aspect of participating in global initiatives. IIIU and EEEU received public funding as well as student tuition. As for the OERu, it was formed by international partnerships with both accrediting and non-accrediting tertiary institutions and received funding from donors, sponsors, and PIs. Given the different possibilities and benefits of interactions and funding at stake, PIs and the OERu should examine their partnerships and sources of funding to determine effective practices to better leverage them to evolve towards stronger OER and OEP engagement.

In the partnership between the OERu and its PIs, there was some misalignment in terms of conventional versus agile processes for OER development. Course developers at both PIs used their usual course development processes rather than adopting the new approaches such as the OERu's agile method. This demonstrates the challenges PIs faced in changing their approach to design and development. While the desire to offer an 'open' course was evident, it was harder to follow 'open' processes of development. Another example of misalignment with the OERu was EEEU's strong interest in the aesthetics of the course presentation, which resulted in them using a separate platform from that of the OERu to deliver their course. Despite the misalignments, these findings showed that the PIs were able to complete the development of OERs even if they did not adopt the OERu's processes and tools; instead, they worked in familiar ways supported by their organizational ecosystems. Given the variety of learning experiences, the focus on instructional design and course quality, and the interest in professional development and, overall, educational evolution, it would be

beneficial if the PIs could have shared the lessons they learned in developing an OER for the OERu in a summary or presentation. Considering the OERu's interest in having PIs work together in building a collection of courses, it was a lost opportunity that lessons learned about these course developments were not shared beyond individual institutions. Therefore, the OERu should encourage PIs that have developed a course to share their experience of the tools and processes they used to build OER in a common space with a clearly identified tag on Community.OERu.org. This would assist in building a community of support.

Continuing on the topic of OER development, both PIs raised concerns about issues related to student safety, privacy, and ethics in open education. For the OERu, there were also ethical considerations in that the open source technology did not collect students' information. What information was obtained from them was not sufficient for triangulating further information. Additionally, the OERu was General Data Protection Regulation (GDPR) compliant (Dubien, Brown, Davis, & Kamp, 2019). Nonetheless, students should be made aware of the implications of their participation in an online course by providing brief and clear guidelines, perhaps in the form of an infographic on online personal data collection. A more general recommendation is that the OERu hold discussions on the topic of ethics in radically open environments and that it implement methods to inform and protect students from harm. An example of how to proceed would be to invite a variety of professionals working in course development, including those with knowledge related to ethics of learning in open environments, to attend an online meeting. The majority of the meeting should be dedicated to exploring ethical approaches to course design leading to the production of a guide for developers of open courses.

The PIs' processes of OER design and development can be examined on the basis of how they implemented OEP after the completion of a pilot project such as the first OER built for the OERu. The process of developing an OER had a significant impact on the PIs in different ways. After IIIU

completed its course development, it formed a growing and stable team of OER developers in an ecosystem community. It sustained itself and expanded its scope as an OERu partner. In contrast, EEEU's ecosystem community for developing courses stopped producing OER and later collapsed under the stress of organizational restructuring. Despite the demise of this ecosystem, the organizational ecosystem benefitted from the experience through the knowledge and skills gained in OER development. In other words, the pilot project stimulated evolution across the institution towards increased engagement with OER and OEP, even if it was not for the benefit of the OERu. This longitudinal view exposed the importance of particular people in the process of building OER: Stephen and Samantha at IIIU and John at EEEU. In their course ecosystems, none of them were keystone species, and all of them were instructional designers. By the end of their pilot project, they had a wealth of knowledge about OER and OEP. Thus, it appears that this role is significant not only for course development, but also for larger institutional initiatives related to open education. This is perhaps because of the variety of skills involved that relate to other organizational departments. Indeed, having a central person within the institution to support open education projects facilitates their success (Otto, 2019). Based on these findings, the OERu should support the inclusion of instructional designers in OER development projects when forming partnerships while explaining the motivations to do so, as outlined above. Additionally, the influence of instructional designers and different roles on OER and OEP engagement within PIs should be examined. The purpose is to better define these roles in terms of which processes they engage with to result in better outcomes of open educational initiatives.

While instructional designers have been found to play a key role for supporting OEP implementation at PIs, it is not clear what role they play at the OERu. It is at its origin an OEP initiative, and therefore does not require the same type of efforts from the same type of roles as in the PIs. Given that the OERu has diversified its ecosystem by hiring LTSs, it should examine its outputs to determine

whether increased addition of instructional designers or further diversification of roles would be beneficial in attaining its vision.

Participants in this research were not only OER and OEP champions at their institutions. They were also driven by a personal interest to improve education or their organization. Stephen advocated for OER among various groups, Samantha promoted Indigenous and multicultural education, both Stephen and Samantha volunteered personal time to develop a course, Trevor increasingly addressed safety and legal issues to protect students, and John made consistent efforts to build bridges across his institution. In short, these people demonstrated leadership in following their convictions and using their personal and professional strengths to go beyond promoting open education by enhancing it in their individual ways. Individual actions like these shape organizational cultures and push the evolution of educational ecosystems. Therefore, individual members at PIs should identify their strengths and interests related to OER engagement and OEP implementation to consider how they might be best suited to make a contribution.

Discussion of broad findings related to stressors to OER engagement and OEP implementation

An examination of stressors related to OER engagement and OEP implementation at the OERu, IIIU, and EEEU is provided as a broad-spectrum analysis. It is also provided as a model for performing this type of analysis from several perspectives. The aim is to assist in planning for innovations based on OER and OEP by using knowledge gathered from actions reported on in this research. This section refers to Appendices 9 and 10.

The tables in Appendices 9 and 10 are structured such that the category label (Access, Permission, etc.) of Cox and Trotter's (2017b) OER adoption pyramid is found in the first column to label the rows. Looking at the top row, the columns are organized in sets of three roles for each ecosystem, from the course ecosystem on the far left to the global ecosystem at the far right. Within each set are the same three roles: Student, Course developer or facilitator, and Administrator. These roles

represent the participants that I interviewed or observed in this research. In cells at the intersection of any role (column) with a category (row) are stressors found in the current research. A grey cell indicates that a given point is not applicable. A blank (white) cell indicates that a stressor is likely to be found. To be clear, the blank cells do not represent my findings, but rather a prediction that a stressor likely exists. Where there are stressors, they are indicated in orange if they mostly represent a barrier to OER engagement or OEP implementation and green if they mostly represent enablers.

These tables reduce some of the features of the Arena by not including non-living matter, by not organizing the matter according to sectors, and by not being holistic since not all species shown in the diagram are represented in the tables. The sectors are partially and indirectly represented through the roles. The students partially represent the community sector, the course developers and facilitators partially represent the professional sector, and the administrators partially represent the bureaucratic sector. I could have added more tables to account for the remaining roles and sectors, but I focused on those that correspond to the research questions.

The stressors can be analyzed briefly based on the ecosystem level in each table. In Appendix 9 showing the OERu's stressors, most stressors are in the Global ecosphere at all levels of the Pyramid from Awareness (Level 3) to Volition (Level 6). This is expected given that the OERu is a global network. In Appendix 9 showing the PIs' stressors, most stressors are in the organizational ecosystem for the categories of Permission (level 2) to Capacity (Level 4). This is expected since the PIs focus on work in the organizational ecosystem. Beyond that level, Availability stressors are all in the global ecosphere since the stressors pertain to OER found online. Volition stressors are scattered throughout the system because there are few constraints on how volition is manifested.

Another perspective for analyzing the tables of Appendices 9 and 10 is to examine the stressors according to the roles of the species involved. A question that the Pyramid asks is "Who is in

control?" When the Pyramid framework is used as originally intended, there are two answers to that question: the faculty member or the institution. (An exception is the Availability category, where OER available online depend on contributions from both inside and outside the institution, the latter being overwhelmingly greater, generally). In this extended framework, the answer can be any known person within the system, or any stranger with access to the internet. The combined Pyramid and Arena frameworks ask the question "Who interacts with whom and how in a given ecosystem?" Based on the OERu's table of stressors, the course developers and facilitators as well as the OERu administration encountered the most stressors in the global ecosphere. Many of the stressors related to sharing knowledge or approaches to facilitate knowledge sharing and skills development. The course ecosystem contained few stressors about specifics of course design, development, and delivery. In the PIs' table in Appendix 9, many of the stressors related to organizational administration particularly in the lower categories. This trend was expected, given that the Pyramid is based on the premise that the institution has more control at lower levels. The administrators' stressors (aside from the structural ones) related mostly to supporting OER development. Aligned with this trend was that the stressors encountered by course developers and facilitators in the course ecosystem related to the output of this support: increasing skills and knowledge about OER engagement. Both course developers and administrators encounter stressors of Availability in the global ecosphere. The issues with these stressors is that, when insufficient OERs are available, the course developers require a great amount of time to develop materials, and this work may require extensive support from administrators. Thus, OER availability is a major consideration in OER development at PIs. All species had a role to play in the Volition category because this is where personal choice could flourish, while being influenced by social norms and the culture and structures of the ecosystem in question. The stressor of personal initiative warrants further exploration in all ecosystems to learn more about what people in each role would do if they had attained all lower levels of the Pyramid.

A different perspective for analyzing the stressors is to examine prominent patterns in each of the categories. In both tables, Access stressors stand to be better examined, particularly from the students' standpoint, though Access was not the focus of this study. In the OERu's case, Access was largely about providing access to education through its open source infrastructure. The Permission stressors were few because these stressors were part of a highly specific category. I've stretched its meaning in this research from Intellectual Property Rights of courses to include open source software licenses. That these stressors occupy a full category signals their significance to OER development. Awareness stressors affected all roles across all ecosystems. This point highlights the value of spreading awareness to all species or stakeholders related to OER, though they may all have drawn different benefits from OER. They were all part of an ecosystem, so the benefits may have propagated in different ways from some roles to others through their interactions. Capacity stressors focused mostly on administrators and course developers and facilitators. That is mostly because of my research design; I chose to include course developers and facilitators as well as administrators in my research, and to ask them about their experiences with OER engagement. I chose not to include students except to observe them in LiDA103. Thus, these findings are more informative about obstacles and opportunities to capacity development for tertiary education employees than for students. Similarly, Availability stressors related to the work of the same roles; no information was obtained on how OER availability might be of concern to students. We do know that they were advocating for OER as textbooks, so they wanted increased OER availability. However, I did not collect data on the impact of availability of OER as courses for students. At the Volition level, the OERu's stressors mostly related to the global ecosystem because of its globally networked nature. It was also because I only obtained the OERu CEO's perspectives on OER engagement as a course developer and administrator. With the increased number of roles at the OERu, there was the potential to discover more stressors related to course development. The PIs had a greater variety of stressors likely because their ecosystems were more diverse. The result was more complex relationships and behaviors related to OER engagement and OEP implementation.

A final perspective for analyzing the OERu's and PIs' stressors is to examine trends and outliers of stressors in each category in greater detail. The OERu was focused on Access by spending so much of its resources on infrastructure that it developed from open source software. In contrast, the PIs worked with structures they had had for decades with likely periodic renovations or upgrades. As well, they were each supported by IT staff. An important aspect that remains to be explored is just how limited students' access is with respect to the OERu and the PIs. With the OERu, it may also be worth investigating whether PIs from different regions have issues with access, and to what extent, with which technologies, and with what kind of IT support. As for PIs, their experience with students in their region and country means that they are likely familiar with the access issues that students might have. Regular needs assessments can provide updates.

To continue with the analysis, I am skipping over the Permission category since it has been sufficiently discussed. I will proceed to the next category. PIs seemed to be far more concerned with Awareness than the OERu. This is likely because the OERu worked with PIs and prospective PIs who were aware of OER, however deeply that may have been. At PIs, where course development could involve a large amount and variety of roles as well as significant costs, the potential for saving time and funds in development was considerable. Thus, the participants in this work may have focused more on this point than the OERu CEO because they were conscious of the potential for expanded use of OER, and wanted to see awareness increase. On a different note, the participants from the PIs knew of the value that students had for OER as open textbooks for cost savings. This means that students had a high awareness of open textbooks. However, little was mentioned about students' awareness of OER as courses and how they could influence their learning.

In the Capacity category, the stressor of the challenges of teaching and learning in open online environments was illustrative of many of this category's stressors. Stressors can have a stimulating

effect, causing different species to change their behavior, in turn causing the ecosystem to evolve. In this case, there was the potential for instructional designers to be stimulated by barriers such as technological and pedagogical challenges. Potential benefits of overcoming these barriers were the subsequent spread of knowledge and the development of effective educational resources among colleagues. However, structural barriers at an institution could impede this work for the staff. Thus, this kind of tension should be reduced by institutions if the desire is for instructional designers to develop high-quality OER. At the OERu, it was shown that professional development for pedagogical improvement of courses was not an immediate priority, and that it had made resources and tools available mainly for development of technological skills. In contrast, the OERu was interested in building up students' capacity, as evidenced by its prioritizing the development and launch of LiDA. Given the complementary perspectives of the PIs and the OERu on capacity development related to OER design and development, there was the potential for a rich ecosystem formed by the PIs and the OERu. This potential will more likely be realized with stronger coherence of the OERu and the PIs for capacity development with regards to both pedagogy and technology in open education.

In the category of Availability, participants from the PIs were concerned about the limits of the types of OER that could be available to them. Production of OER was most beneficial at PIs when high quality OER were available as starting materials. Given that they developed courses at a variety of levels, they saw the need for OER for courses with great demand such as first-year courses as well as courses in higher levels, which were taken by fewer students. For the OERu, Availability of OER was less of a concern because most of the courses they were offering as part of their MVP were common courses where OER were abundant. In addition, the OERu was interested in the Availability of open source technology for the development of its infrastructure and NGDLE. For the OERu and the PIs, there was a dependence on what others had shared online. This is significant because this availability was a powerful limiting factor that could inhibit development of OER or open source

technologies. Perhaps this stressor could provide the stimulus needed to think differently about how to produce OER and open source technologies without depending so strongly on what is available.

In the category of Volition, the OERu had many stressors related to organizational issues. Additionally, the stressors for course developers and facilitators were largely about how to work rather than processes that directly facilitated OER engagement. There were also stressors related to students' will to engage with others while in an online course. These stressors did not fully align; there was room to take action on the students' level of engagement. With the OERu focusing on its production and launch of courses, there was an opportunity for instructional designers from PIs to examine the courses and use agile methods to suggest learning activities to boost student-student interactions. Educational researchers and available research publications could be of assistance in this work as could be staff from PIs who have offered student support services.

In contrast to the highly ordered OERu stressors in the Volition category, those of the PIs were scattered throughout the ecosystems and roles, with many of the stressors not being directly related to OER development. However, one important stressor was that of personal initiative, which arose frequently as a stimulus for change. Given its importance in this research, It seems that it is worthy of further exploration across all roles and ecosystems. There is value in knowing what motivates people who stimulate change and how they are influenced by their environment and organizational cultures.

Following these different perspectives for analyzing the tables of stressors, it is worth exploring how the Arena-and-Pyramid framework facilitated a greater understanding of OEP implementation at the institutions examined in this research. As indicated by Steiner (2016), human ecology accounts for past and current actions. In this research, the Arena extended by the Pyramid shone a light on stressors in the OERu's and PIs' ecosystems. These stressors acted as a proxy to indicate what kind of

actions were taken in a given OER or OEP initiative. They also revealed roles, ecosystems, and categories that were unexplored and worth examination. Thus, when species engaged with OER, their behaviors were examined in my research, and I could refer to them in my Arena-and-Pyramid-based diagrams and tables. The more my participants had engaged with OER, and the more varied were the forms of engagement, the more stressors I could uncover. Conversely, low activity or unexplored behaviors like those of students left some stressors undiscovered. In other words, participants who had experimented in a variety of ways with OER design, development, and delivery, who took note of barriers and enablers, and who reported them to me, allowed for richer data to be reported. Thus, for future innovations in OER and OEP engagement, it is strongly recommended to take the approach that the OERu, IIIU and EEEU did: develop a single OER as part of a pilot project. These projects should include as many species as is reasonable, and at least one instructional designer. Also, representatives of each species should experiment extensively within the pilot and document the stressors and any action taken to deal with them, be it to enhance or limit their influence.

My data collection and analysis processes were informed by my experience as an instructional designer and as someone who has engaged with OER for years. Thus, the obtained findings corresponded largely to design, development, and delivery of OER and did not focus on other aspects that could be significant in open education initiatives. Another point is that some roles filled by people such as Stephen, Samantha, and John were highly active and contributed rich data despite not being a keystone species in their respective course ecosystems. Consequently, when analyzing an innovation using these frameworks, one must carefully choose whom to collect data from; keystone species are not necessarily aware of all actions taken and lessons learned during a course development. Thus, to obtain a more rounded and holistic data collection and analysis, institutions that apply this stressor analysis should involve representatives from various roles to analyze and discuss the data together. Facing challenges collectively allows shared knowledge to accrue and in

turn, to foster the development of a culture - in this case, a culture of OER development and OEP implementation. Consequently, pilot OER projects should be managed, documented, and analyzed carefully so that the ecosystem in question can evolve in beneficial and sustainable ways. Further projects and accompanying data collection and analyses should help to develop a pattern of behaviors and allow actions to translate into assumptions as the organizational cultures of OER development become more deeply ingrained. This point is important since Cox and Trotter's framework revealed the importance of organizational cultures for the OER engagement category of volition.

During planning stages, stressors related to instructional design (e.g., alignment of objectives with course component, choice of teaching and learning methods) should be clearly separated from stressors related to OER engagement (e.g., finding OER, using Creative Commons licenses correctly). The reason is that the tasks of developing an OER strongly overlap with the tasks of developing a course, and they can be confused, particularly by people who are new to course development and OER. A strong delineation between stressors related to instructional design and stressors related to OER engagement will allow for more suitable and effective planning.

Once the stressors have been analyzed and discussed, it will be possible to take planning steps for OEP implementation. The variety of stressors gives way to different strategies for planning an OEP initiative in a tertiary institution. One approach is to resolve or enhance the stressors (depending on whether they enable or inhibit OER engagement) at lower levels of the Pyramid before moving to higher levels. One could take a multi-pronged approach and address different stressors in several categories. Alternatively, one could work with people in specific roles before moving on to including more people in the plan. Another option is to increase the material resources within the system by adopting OER or open source software or purchasing commercial resources to assist with open education initiatives. Many possibilities are available, and it is for each institution to decide on which

approach is best suited for them. The approach will be informed by the organizational cultures at the institution, and that topic will be examined next.

Examination of typology related to organizational cultures

The current study found that the OERu had focused on open source technologies and the open source community's methods for much of its existence, resulting in a strong and successful technological evolution. It had also been promoting open education and OER. In late 2018, the International Partners made requests for the OERu to increase its educational evolution by hiring staff for course development. At the same meeting, there was a call for a survey to examine the barriers and enablers to their engagement with OER, the OERu, and open source technologies. These findings seem to indicate that there was interest in having the OERu further evolve educationally and in having the PIs further evolve towards open education and OER engagement. There also seemed to be an interest in seeing the PIs evolve technologically to increasingly adopt open source technologies. Thus, for the OERu, it was a matter of increasing species diversity. For the PIs, it was about gathering information to eventually increase the diversity of skills by increasing the capacity to use open source technologies. As indicated by Steiner (2016), richer ecosystems are more adaptable and lead to sustainability and possibly growth. According to Cameron and Quinn's (2011) CVF, a culture that is adaptable and intended for creative work such as the development of OER is one where values focus on flexibility. With the intention of the OERu and PIs to increase OER development, they were seeking growth to the point that OER would become part of mainstream global tertiary education. Hence, there was an external focus. These points suggest that a culture beneficial to attaining these goals is the Adhocracy. Further, for ecosystems containing diverse species to thrive, there needs to be cohesion. Where team members are diverse and adaptable while also focusing internally to develop unity, there is the Clan.

If the OERu aims to increase its Adhocracy, the leadership should focus on innovation to foster growth. For such a change to be effective, one must foster the development of cutting-edge

products (OER). The OERu's technological portion of its ecosystem was advanced, and there was the potential for experimenting with pedagogical aspects of OER to enhance student engagement. Thus, the OERu could examine ways to increasingly address pedagogy in its OER development processes. In an Adhocracy, leadership is distributed among the team members, and individuality is encouraged. Thus, OER development should occur such that team members are allowed the freedom to propose ideas and apply their individual strengths (Cameron & Quinn, 2011).

If the OERu wants to increase its Clan, it could build morale and facilitate work while creating a warm, receptive, and supportive environment. The values to be promoted are participation and individuality. With such values, teams are semi-autonomous and empowered to provide feedback and ideas. For further emphasis, a strong sense of cohesion and high morale are essential to the Clan (Cameron & Quinn, 2011).

In order to facilitate these developments in organizational culture in the future, the OERu and the PIs should share more about each other's strengths, weaknesses, and interests with regards to the projects they intend to collaborate on. Discussions on this point or a survey for examining OER engagement (McKerlich et al., 2013) can be of use while adding a component for open source technology. In addition, individual staff from a PI interested in engaging with the OERu should fill out a form indicating their strengths, weaknesses, and interests in engaging with the OERu. Subsequently, they should determine what they need to know so that they can engage in ways beneficial to both their institution and the OERu. The OERu should hold sessions to answer PIs' questions that they are comfortable asking publicly. Such an approach can inform the PIs about how the OERu works so that there can be a better mutual understanding of how the institutions are aligned. This point addresses the stressor mentioned by the OERu CEO that PIs had difficulty understanding how the OERu functioned. As the OERu continues to grow and diversify, I recommend this approach more strongly. There is the potential for mutual benefit for PIs and the OERu so that

they can co-evolve and more effectively fulfil the vision of providing education to students everywhere.

Indications about organizational cultures at the PIs suggested some implications for OEP implementation. At IIIU, the Hierarchy seemed to hamper innovation in open education, while the Clan favored OEP implementation for IIIU's students. The Adhocracy appeared to favor innovation of OEP with regards to the partnership with OERu. Thus, the Adhocracy may have been supporting OEP for globally dispersed students. The apparent dominance of the Clan among staff at EEEU seemed to favor OEP implementation. This is because staff seemed eager to form collaborations or to consult with each other and to provide education that would benefit their students. Thus, the Clan may have favored OEP implementation for its own staff and students.

An overview of the findings examined according to Schein's (1990a) Three levels of organizational culture can inform future research. Findings at the artefact level indicated the institutions' missions and, for IIIU and EEEU, provided a cursory description of the physical space. An expanded examination of the artefacts may have allowed me to gain a deeper understanding of why and how certain patterns of behavior occurred. My ability to interpret artefacts was hampered by not knowing each institution's underlying assumptions. What findings I did obtain were filtered through the perceptions of the participants. Similarly, findings related to the espoused values were largely based on participants' perceptions.

Though unable to identify underlying assumptions of the institutions in my study, I was able to make some reflections. Given the OERu's early stage of growth, its underlying assumptions may not have fully developed. The departure of people like Stephen and Samantha with their years of experience in course development, OER development, and in participating in OERu activities, could have further delayed development of the underlying assumptions (Schein, 1990b). In contrast, IIIU and EEEU were

mature institutions. The participants in my research had all been long-standing employees at their respective institutions. If this trend were widespread among staff, - and it appeared to be so at EEEU - it would mean that the underlying assumptions were strong and stable (Schein, 1990b). Restructuring activities at IIIU and EEEU may have had an impact on the assumptions, but no evidence was gathered on this point.

To strengthen these findings, future studies could use the CVF and a more extensive application of the methods recommended by Schein (1990a) in section 2.5. The implications of a stronger understanding of the three levels of organizational culture (Schein, 1990a) could assist the OERu in further developing its culture so that it may more effectively realize its mission with stronger support from its PIs. For institutions such as IIIU and EEEU, a stronger understanding of their cultures could facilitate decision making regarding how they want to attain their strategic goals. With both PIs having demonstrated increased engagement with OEP, it is worth examining their organizational cultures further to determine whether they align with increased openness in their educational programs and services.

From this discussion, several points can be derived. To begin, openness should be considered as a means to an end in improving the learning experience and increasing access for students. This is in contrast with promoting openness as the end. This view was advanced by Conole and Brown:

> There is a lot of rhetoric around the potential of open practices and naïve assumptions about their impact, but it is important to caution against this; they are not inherently good in themselves but more so with how they are appropriated. In other words, the nature of and benefits of open practices depends on the context, i.e., how they are applied and implemented (Conole & Brown, 2018) p.189.

A similar point was expressed in the literature review, where it was indicated that open textbooks had not been shown to improve learning outcomes for students (Al Abri & Dabbagh, 2018; Hilton, 2016; Wiley et al., 2014). The achieved benefits of open education are to be celebrated, but their

true impacts and limitations must be recognized as well. From this position, it is possible to advance open education in practical ways. The following remarks explore such practicalities.

When building a course, faculty and instructors' skills and knowledge are essential for developing content, and IT staff are essential for making the required technology function. Colleagues distributed globally can be reached through various channels to further support this work. It is instructional designers, supported by development teams, who combine pedagogy and technology to create teaching and learning experiences by developing a sequence of learning activities and assessments tailored to particular goals. This creativity is the stimulus for co-evolution of education and technology. In open education, there is an added layer of knowledge of open licensing and the context of learning openly online with or without OER-enabled pedagogy. In this respect, librarians and copyright advisors support instructional designers.

Unfortunately, faculty members often function in ecosystems separate from those of staff who support instructional design and development as well as OER engagement. In other words, these ecosystem communities co-exist within a larger organizational ecosystem, but do not greatly overlap in terms of their production of courses or OER. Staff members can reach out beyond their ecosystems to faculty to offer support, but faculty often develop courses without this support. With individual or institutional volition, this situation could change; there could be stronger collaboration among faculty and staff through the formation of a larger symbiotic ecosystem. When faculty, instructional designers, development staff, IT staff, and library staff develop their respective skills for developing OER and work together in a cohesive and innovative culture in a thriving ecosystem, they can overcome the barriers and enhance the enablers of OER engagement. The result is that pedagogy - particularly that for open environments - and technology co-evolve under the best circumstances. Ideally, students would be involved in the design and development process and would benefit from this co-evolution through higher quality courses, and in turn, improved learning

experiences. As we've seen, access to education alone will not meet students' needs if factors outside of education impede their learning. This is why students need a supportive ecosystem community to thrive in tertiary education. When all of these points coalesce, OEP implementation and its benefits can be fully realized.

8.2. Conclusions based on the findings

The findings and the discussion led to conclusions that answer the questions of the current research. The main research question was: In what ways are tertiary education institutions that develop openly licensed courses implementing Open Educational Practices? The answer to this question is provided below, by providing conclusions associated with each guiding sub-question.

What is the typology associated with the organizational cultures of the institutions involved in this research?

At the OERu, it appeared that the typology most closely associated with organizational culture was the Adhocracy, in large part due to the OERu CEO's emphasis on adopting the open source community's processes. The OERu also expressed a desire to collaborate with institutions distributed globally, which is associated with the Clan. At IIIU, the organizational culture typology seems to mostly be associates with a Hierarchy because of the structured approach to work and the separation of departments within the institution. There are signs of the Clan as well, because of the close relationships among staff, which are strengthened by common values to provide learners with access to education. There were signs of an Adhocracy in that staff members had freedom to innovate with OER. At EEEU, the organizational culture typology seemed most strongly associated with the Clan for similar reasons to IIIU. The Clan characteristics were purposely nurtured by the OEP manager as a way to promote further innovation in education.

How are tertiary education institutions implementing OEPs, particularly for instructional design, development, and delivery of OER as courses?

At the OERu, the LiDA course was developed largely by the OERu CEO as the keystone specie in consultation with the OERu community. Members of the community offered suggestions for revising the work. At IIIU, a team of two highly experienced instructional designers, one of whom was an

administrator and a keystone specie, conducted the design and development work. They adapted an existing course so that the content included materials that reflected a variety of national cultures. They conducted much of the work on their own in their organizational ecosystem and paved the way for further OER development at their institution. With time, their symbiotic partnership with the OERu has grown. As a result, there are more tertiary education course options available for learners. At IIIU, a team of instructional designers and a subject matter expert (keystone specie) developed a course together. They were guided by the OERu CEO and OST regarding Creative Commons licensing and coding in WikiEducator. The course development ecosystem at EEEU collapsed as employees left the institution. The course development at IIIU did not lead to further course development. However, knowledge and skills related to open education spread throughout the organisation. Evolution occurred internally as the OEP manager supported the spread of knowledge about open education by facilitating bridge building across the institution.

What are the stressors involved in OER engagement and OEP implementation?

At the OERu, many of the stressors are at the global level an relate to sharing knowledge and facilitation of knowledge sharing and skills development. At IIIU and EEEU, most of the stressors are at the organizational level and relate to supporting OER development. Important stressors were related to Availability of OER in the global ecosphere. The more OER of good quality were available, the more the PIs could engage with OER. The Volition category contained many stressors across all institutions in this research; it was likely because all participants in this research are leaders in some form. Their leadership was manifested in their volition to innovate with OER.

8.3. My contribution

In terms of open education, my contributions relate to the use of frameworks in open education for planning OER engagement and OEP implementation. They also relate to the OERu, to the design, development, and delivery of OER and to inter-institutional collaborations for the provision of open education. I will also describe the significance of my research to the field as well as the impact and consequences of applying knowledge from my research.

This is the first ethnographic case study in which an ecological approach was used in open education and more specifically on the design, development, and delivery of openly licensed courses by tertiary education institutions. The ecosystem framework highlighted the interactions of the OERu and organizations in various sectors that worked together in multiple overlapping ecosystems to realize the OERu's mission. This mission was shown to benefit from several of New Zealand's initiatives, with some occurring as a direct result of collaboration with the OERu. With the mention of the establishment of the COEP as a national provider of open education, this research updates the literature on open education initiatives supported by this country.

I analyzed the OERu's global networked system based on open source technology and examined how the OERu CEO, as a keystone species, influenced the culture of the organizational ecosystem by modeling the OERu after the open source community. The Arena framework provided an ecological lens on how the OERu built, updated, replaced, used, and managed different open source platforms to support communication for different purposes. These platforms supported the OERu's coordination of its PIs in the disaggregated system of providing assessment and accreditation services. These platforms also formed the NGDLE that was used in LiDA to support student-student interaction. The Arena's concept of evolution underscored the OERu's role of evolving technology, the PIs' role in evolving education, and the benefit of a rich ecosystem. Rich ecosystems with various roles can be tapped to collaborate so that education and technology co-evolve coherently. In turn, these ecosystems can provide high quality learning experiences of open education based on suitable technologies and purposeful pedagogies.

Further, the Arena enabled a new understanding of how the OERu applied the principles of open philanthropy by openly publishing its planning documents. It also helped to show how the OERu supported open communication through a variety of platforms configured for different purposes. As

an example, I explored a series of communication events that revealed the extent to which the OERu consulted its PIs for strategic planning. The provision of open communication enabled individuals from PIs to provide each other with feedback on ideas and projects. The ability to store planning documents allowed for referral to the OERu's past projects, though navigational challenges inhibited access to the documents to an extent. Given the complex interactions across a global network, the OERu was well suited to highlight the use of the Arena framework for analyzing roles and organizations working together on innovative open educational technology.

I further applied the Arena to examine the OERu's system centered on the design, development, and delivery of OER. The Arena shone a light on activities, which made it easier to see that some connections between professionals were yet to be made. For example, some instructional designers sought guidance about creating OER using OERu's approaches, while other members of the OERu were developing pedagogies. The Arena revealed that these needs and solutions co-existed and could be matched. Thus, those with a greater awareness of the possibilities afforded them by their connections could evolve, as could their ecosystems. Indeed, PIs were evolving in their offerings of open education both as part of the OERu's initiative and outside of it. Thus, the Arena provided an opportunity to increase awareness of PIs' and the OERu's environments to allow them to benefit from interactions across the system when engaging with OER.

Various experiences of OER production such as those of Wanda and Rory showed that species in different communities had self-organized to develop courses in ways that their respective ecosystems allowed for, all while contributing to realizing the OERu's mission. Lessons learned from these experiences that are shared in the global ecosphere allow for species in additional tertiary ecosystems to take them up, if they so choose. Thus, interactions across the ecosystem can stimulate evolution and co-evolution throughout. The Arena's holistic perspective facilitates the

identification of such opportunities as well as challenges. Thus, my work highlighted functions and benefits of the Arena.

The Arena emphasized how the OERu interacted and collaborated across the global ecosphere with institutions and individuals using its open source platforms (WikiEducator planning pages and Kanban boards) to build LiDA. With the planning documents and video recordings having been made available indefinitely, anyone can consult them and adopt these practices. Thus, the Arena showed that the OERu's influence reaches globally and across time. Similar observations apply to LiDA103: the course and student postings using the tools in the NGDLE are available for any to see. All of these materials are also available to be improved upon, showing that openness to global partners allows for evolution towards higher quality pedagogy and use of technology; innovation in a course ecosystem has the potential to stimulate evolution throughout the global ecosphere.

The examination of the OERu's delivery of a micro-course builds on previous work on a similar version of an open boundary course (Davis & Mackintosh, 2013). Hence, my research extends the literature on open pedagogy by demonstrating an instance of informal learning in an open environment. It was novel in that it revealed how it used an automated email system to inform students about various aspects of the course, how an open course could be presented in WordPress to ease navigation, how its open source tools were used to form a NGDLE, how a facilitator can interact with students, and how students interacted. The current research also highlighted the OERu's agile process which continues to be applied to improve LiDA, for the benefit of those curious to see how it develops. To encapsulate my contribution related to these points: my research revealed opportunities and challenges of cross-cultural global systemic change to implement open education as a collaborative effort among international institutions for students located anywhere.

The examination of the case of OEP implementation by IIIU and EEEU showed what kinds of organizational ecosystems can support open education innovations and how, with their different strengths, weaknesses, interests, and characterizations, each tertiary education institution can facilitate and stimulate evolution. The Arena also underscored the importance of alignment of ecosystems through missions and actions in inter-institutional collaborations. The holistic, global view showed that different forms of partnership bring their own benefits. For example, IIIU's inter-institutional collaborations enriched professional development, while EEEU's international collaborations provided exposure and access to culturally different approaches to open education.

The Arena highlighted the consequences of PIs' engagement in OERu activities following their development of an open course. IIIU developed a stronger course development team and stronger collaboration with OERu, whereas EEEU developed stronger OEP among staff in course development and departments across the institution. The Arena examination also showed that, while keystone species were influential in some ways in reducing disruption caused by an innovation, those who were highly engaged in the day-to-day work had an advantage: rich lived experience. This experience is crucial to informing future innovations. Equally crucial is the personal drive of motivated OER and OEP champions with their diverse expertise. The Arena has shown the value of diversity in enriching an ecosystem for the benefit of its sustainability and evolution. From the diverse roles and actions taken arose a variety of challenges and opportunities. There also arose barriers and enablers, conceptualized as stressors in this research. This is the next topic I will use to demonstrate my contribution to scholarship and practice.

This study is the first to extend Davis' (2018) Arena with Cox and Trotter's (2017b) OER adoption pyramid to examine how institutions engage with OER and implement OEP using an ecological lens. This extended version of the framework allowed me to categorize stressors involved in OEP. My contributions to scholarship regarding stressors are indicated in Appendix 8. This extended

framework was additionally used to examine stressors related to the Arena framework and allowed for the description of interactions of roles and matter within their respective ecosystems and throughout a global ecosystem. It highlights the keystone species' role in influencing the success of an innovation. It also acknowledges other species' role – particularly that of instructional designers – in experimenting with an innovation and gathering detailed data essential to refining planning and implementation.

The Pyramid framework extended the Arena framework by making the stressors related to innovation more prominent. In this case, the stressors were related to innovation with OER and OEP. The Arena also extended the Pyramid by going beyond barriers to include enablers and to use the encompassing term of stressors. The Pyramid was extended so that the framework could include not only faculty and institutions, but any species relevant to change with educational technology involving OER and OEP in tertiary education. The Pyramid was extended so that it could examine more than the institutional level; in this research, the scope was expanded into the course ecosystem, and the regional, national, and global ecosystems. Research with a larger scope than mine and with a greater diversity of participants has the potential to more obviously show extensions of the Pyramid to more species and matter.

Through integration of the Arena and Pyramid categories, I offered a new analytical approach and way of visually representing the ecosystem of different types of institution. This approach accentuated the variety of ecosystem communities found within. Such knowledge calls attention to the types of networked interactions that can be beneficial, according to their respective natures. The integrated frameworks also involved designing tables (Appendices 9 and 10) to support analysis. The tables were used to examine portions of the Arenas to classify stressors according to the Pyramid's categories and selected roles and ecosystem levels. One drawback is that this approach takes away

from the Arena's holistic character. The choices made in labeling the columns are the greatest source of variance when adapting data representation from the Arena diagrams to the tables.

The analytical value of the tables changes based on the interpretive perspectives one uses. The interpretation according to species accounted for the roles as qualified by the context of the ecosystems they were considered to behave in. It allowed for the identification of ecosystems and roles that had the greatest number and most impactful stressors and groups of stressors. It also showed that some stressors in particular categories affected a variety of ecosystems and roles, albeit in different ways. Other stressors from a given category affected only one or two roles.

Distinguishing the breadth and depth of these stressors informs the planning of subsequent OER and OEP innovations. It challenges the decision-making process regarding how to distribute efforts and materials to make an innovation successful while minimizing disruptions to the system. More information about each category helps to better understand how each role can implement OEP.

Another perspective examined the stressors according to the Pyramid categories. This approach showed that only some species are relevant to some Pyramid categories. It also showed that some actions occur on a broader scale for categories such as Access and in more specific ways for categories such as Capacity. The Volition category involved the greatest amount of variability and creativity in addressing stressors. Inversely to the previous perspective, having more information based on a variety of species helped to better understand the types of actions to take for each category. The final perspective was the most detailed, where the roles of species across the categories were examined. Patterns and outliers were examined in greater detail to obtain the richest and greatest amount of information related to OER engagement and OEP implementation.

All of these approaches can be used to determine where further information is required regarding the stressors; some stressors can be anticipated, some can be refined, some can be moved to a different position in the table according to how they are redefined, etc. To use the diagrams and tables effectively for planning for OER and OEP implementation, an innovation or a pilot project is needed in the first place. Stressors that must be documented, and all species should reflect on them collectively. Putting such diverse knowledge together cohesively has the potential to enhance planning for OER and OEP.

The significance of my research is that it aimed to start filling a gap in the research about OER engagement. This objective has been achieved to the extent that I have provided new ways of thinking about OER engagement that are founded on empirical data using a complex theoretical framework. I have directly communicated my findings to my research participants, the OERu members (and anyone else with an internet connection) who saw my posts about my research, and audience members attending my research presentations. Many of these presentations occurred in New Zealand at conferences and at presentations I gave at my institution. I also gave presentations at OER19, at PCF9, and online for the Australian OEP special interest group and GOGN seminars at OER19 and OER20. These presentations all highlighted the role that the OERu plays in promoting open education through its partnerships with institutions located globally, its openly licensed courses, and its open source infrastructure and NGDLE. The promotion of this research has thus highlighted the OERu's and New Zealand's roles as global leaders in open education.

The context that led to this particular research being done at this time was my experience in instructional design and in providing training tertiary education staff to engage with OER. These circumstances were accompanied by the timing in the Open Education community where the focus was shifting from a OER access to OEP implementation. Additionally, the OERu had been developing its infrastructure and its bank of openly licensed and accredited courses to offer to students

excluded from traditional tertiary education. By the time I conducted my research, some of the OERu Partner Institutions had developed at least one openly licensed course, and the OERu was ready to launch its LiDA course for the first time. There is increasing demand for tertiary education. As the findings have shown there is also increasing advocacy for OER. This research aimed to respond to the demand and advocacy by exploring ways to align OER engagement and OEP implementation with organizational cultures. This research also aimed at finding ways to improve OER and OEP engagement in ways that are sustainable and in line with the desired evolution of pedagogy and educational technology.

The impact of this research is that it provides examples of planning for innovations in open education in a holistic and ecological manner. It accounts for stressors that signify opportunities and challenges that can influence how a system evolves through the innovations. It is relevant to any tertiary institution interested in innovating with OER and OEP. This thesis provides an example of conducting research in open environments. The data collected from open environments included planning documents; course development pages; and course contributions by students that included their photos, names, and course posts. I also collected data from recorded OERu meetings found on YouTube. The OERu CEO often encouraged me to feel free to collect data published by the OERu, but I still had to respect the confidentiality of anyone identified in WikiEducator pages or YouTube recordings. This point was important since these people did not know at the time of their participation in OERu activities that they were going to be observed for research purposes.

Some aspects of my research posed challenges due to the concept of openness. I had to contend with being asked by Rory McGreal to record an interview and post it online with a CC-BY license. I was surprised by this request since it is expected that research participants want their identity to remain confidential. I was also uncomfortable with recording myself while leading an interview since I was learning to conduct research and preferred not to have mistakes exposed on a globally

accessible platform. I was also asked to conform to the OERu's practices by writing and signing a document indicating that I was committed to publishing all of my work that resulted from this research as Free Cultural Works. Again, as someone who was learning to conduct research, I was unaware of the advantages and disadvantages of making every output of my work so easy to share. In addition, I had to consider my supervisors' points about the implications for my work, one of which was to restrict myself from publishing in closed journals with a strong reputation. I also had to consider that I had received a scholarship on the basis of a proposal to conduct the research that is in this thesis; to refuse the condition of publishing my work in accordance with the OERu's request was to risk losing my scholarship and abandoning the PhD program. It is true that to publish the work with an open license is to be consistent with the values of openness promoted in this research, so it was not too difficult to plan for open publication of my work. Still, I did not feel that I had any choice in the matter because of the commitment I had already made to the scholarship committee with my proposal. One result of this commitment was that I became selective of the channels that I used to release my work. Thus, this research can offer some insight into the process of conducting open research.

8.4. Limitations

In exploring the limitations of my research, I propose different approaches and strategies which can inform future research. One limitation was that I relied too much on online research of the OERu's planning documents. This research was the first step of my data collection described in my methodology. While it provided me with a broad view and history of a large portion of the OERu's work, it did not provide me with a clear-cut understanding of the OERu's main innovations. Those innovations included open source technologies to support student-student interaction in a NGDLE. Another innovation was the disaggregated model of education provision whereby some OERu partners assessed student work while others provided formal credit, for example. What I would have done differently is that I would have had several meetings with the OERu CEO to clarify what should have been highlighted in this research and to clarify what my position was as someone interested in

instructional design. Having several calls or meetings would have also allowed for building a stronger relationship and allowed for clearer communication to develop.

The findings based on the OERu are not likely to be generalizable to any other institution, because it is a unique organization that functions using the most open processes and resources available to it. This organization shows what can be achieved when working with the most extreme forms of openness. As for the findings based on the two Partner Institutions of the OERu, they are not presented so that they can be generalized. Still, those findings are most relevant to institutions that engage strongly with OEP, are familiar with OER, have a large network of staff working on open education projects, and have a mandate to offer open education. Institutions without these resources and processes will find it more challenging to engage with OER and OEP than these two institutions did.

In my studies of IIIU and EEEU, there was no course delivery. As a result, I have no data on stressors pertaining to that point. Data in these vignettes that relate to students was reported by course developers and administrators. Where I did collect data directly from students was based only on observations of a short duration in LiDA103. In short, data based on students is lacking in this study. Students should be included as participants in future studies of this nature to determine stressors related to their experience as it relates to course design, development, and delivery.

An aspect of this work was that it was limited to English-speaking tertiary education institutions in developed countries. There is a disproportionate amount of research coming from the Global North in comparison to the Global South (Bateman, Lane, & Moon, 2012; Cronin & MacLaren, 2018; Weller, Jordan, DeVries, & Rolfe, 2018). This is a point of concern to Bozkurt et al. (2018) who explain that for this trend to continue is a hindrance to the sustainability of open education and will exacerbate the digital divide between developed and developing countries. Thus, if I had to conduct

this research again, I would invite an OERu PI from the Global South to participate in my research. Enablers and barriers of OER engagement have already been examined in the context of the Global South; Cox and Trotter developed their OER adoption pyramid and validated it in case studies involving three very different types of tertiary education institutions in South Africa. Thus, this work shows that the OER adoption pyramid is valid for use in tertiary education institutions in several international locations. In addition, Davis' (2018) Arena is applicable to any educational institution; how well it is used depends on the choices made by the user. Thus, the methodology and frameworks used in this research may be valid in a variety of settings globally.

A limitation with respect to Davis' (2018) Arena is that this research is the first instance where I have used this framework, and it was recently published. There was only one research publication that modelled the use of the Arena to provide an example of its application (Davis, 2019). However, I did have the advantage of being able to consult Davis directly for advice. There are possibly many ways in which my application of the framework could be improved. I will be eagerly looking out for future research that finds alternative ways to apply this framework so that I may be inspired to use it differently.

A limitation of my research was how I used Cox and Trotter's (2017b) OER adoption pyramid. This framework was developed for OER engagement (Cox & Trotter, 2017b). However, my use of this framework included points that were outside of its scope. For example, some points were exclusively about the OERu as an organization and completely independent of OER engagement. I took the measure of identifying this point in the reporting of my interpretation. In this case, I would not change my research method.

The examination of indicators of organizational cultures using Cameron and Quinn's (2011) Competing values framework did not follow the original plan. Originally, I was to use the OCAI, a

survey developed and validated by these authors. However, there were not enough participants at each institution to use the OCAI in a way that was anonymous and valid. There were also insufficient funds to explore the organizational cultures of each institution on site. Additionally, to examine the organizational culture as Schein (1990) recommended might have required that this topic be the entire subject of my research. To do the topic of organizational culture justice in its role of influencing how institutions engage with OER and OEP, it would have been useful to form a partnership with another PhD student who would only examine that topic. My research would then have focused on OER engagement and OEP implementation. In such a scenario, both projects would be complimentary parts of a larger project.

Another limitation regarding my theoretical framework was that I used different frameworks for examining organizational cultures than did Cox and Trotter (2016). They combined two frameworks (Bergquist, 2008; McNay, 1995). The result is that it is difficult to compare some of my findings with theirs. I am satisfied with the choice I made in using the frameworks I did to analyze the organizational cultures. Future research could include analyses using a framework similar to that of Cox and Trotter.

8.5. Future work

Future lines of research can include a survey and follow-up investigations (e.g., interview, focus groups) as deemed suitable among students who are excluded from traditional tertiary education. The purpose would be to assess the amount of time, type of skills, and types of resources they have and need for completing online courses. In the same line of research, I recommend assessing the learners' desired skills and knowledge as well as the variety of constraints and supports for completing tertiary education. Davis' (2018) Arena can be used as a way to map the matter that has an influence on learners' ability to study, including roles in the community and family, as well as the four other sectors.

Future research can involve institutions in a greater variety of regions to examine how openly licensed course development on open platforms is conducted. It can also examine how open source tools for course design, development, and delivery and for student-student interaction suit local needs in various locations. I recommend examining how both course developers and learners from various regions perceive, experience, and negotiate the use of open communication tools and various course subjects in the context of their culture.

My future work with regards to this research includes publishing articles. I plan to publish an article with a theoretical focus by examining Davis' (2018) Arena as it was extended by Cox & Trotter's (2017b) OER adoption pyramid, particularly in the case of OER engagement and OEP implementation. I plan to publish my findings about IIIU and EEEU and their engagement with OER and OEP. Additionally, I plan to develop a model for guiding tertiary education institutions in OEP implementation. The model could be published in the form of a guide complete with instructions and resources for examining an institution's ecosystems and stressors with regards to a pilot project involving OER and OEP.

8.6. Conclusion

Planning for OER engagement and OEP implementation can have a reach limited to the physical or online classroom, or it can extend as far as the global ecosphere to involve almost anyone. With these innovations come opportunities and challenges which have been shown to be complex and for a large part, undiscovered. Experimentation with open source technology and development of open pedagogies have far to go. In this interconnected world, there are many benefits to be gained as long as innovation is planned with care. Open education connects people and allows for a variety of interactions to take place, mostly intended to increase learning knowledge and skills, but also to enrich learners and shape their culture. This is why innovators in open education must take great care that this work be done with consideration of ethics, empathy, and sensitivity to the needs and strengths of students across cultures. At the UN General Assembly of 2018, New Zealand Prime

Minister Jacinda Ardern spoke of the importance of her country's involvement in collective global action to work as a community. More specifically, she stated that New Zealand was committed to pragmatism, empathy, strength and kindness in shaping the world for the next generation (New_Zealand_Government, 2018). For educators, the implications are clear. Education shapes students and how they behave in the world. With open education, this shaping has global reach. So, when designing, developing, and delivering open courses, we should follow Prime Minister Ardern's lead. We should always remember the importance of demonstrating care and kindness to make an example worthy of adoption by our students. Only then will open education realize its full potential.

References

Al Abri, M., & Dabbagh, N. (2018). Open Educational Resources: A Literature Review. *Journal of Mason Graduate Research, 6*(1), 83-104.

Aldiabat, K. M., & Le Navenec, C.-L. (2018). Data saturation: The mysterious step in grounded theory method. *The Qualitative Report, 23*(1), 245-261.

Altheide, D., Johnson, J., Bloom, L., Lahey, M., Bloor, M., Burgess, R. G., . . . West, P. (2003). Transcription quality. In J. A. Holstein & J. F. Gubrium (Eds.), Inside interviewing (pp. 266-287). Thousand Oaks, California: SAGE Retrieved from https://methods.sagepub.com/book/inside-interviewing. doi:10.4135/9781412984492

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: a revision of Bloom's taxonomy of educational objectives* (Abridg ed.). New York: Longman.

Anderson, T. (2013). Open access scholarly publications as OER. *International Review of Research in Open and Distance Learning, 14*(2), 81-95.

Atenas, J., & Havemann, L. (2014). Questions of quality in repositories of open educational resources: A literature review. *Research In Learning Technology, 22*. doi:10.3402/rlt.v22.20889

AU. (n. d.). Professor Rory McGreal. Retrieved from https://unescochair.athabascau.ca/team/chairholder

Ayres, L. (2008). Thematic Coding and Analysis In L. M. Given (Ed.), *The SAGE Encyclopedia of Qualitative Research Methods* (pp. 868-869). Thousand Oaks, California.

Baas, M., Admiraal, W., & van den Berg, E. (2019). Teachers' adoption of Open Educational Resources in Higher Education. *Journal of Interactive Media in Education, 2019*(1).

Bateman, P., Lane, A., & Moon, R. (2012). *An emerging typology for analysing OER initiatives.* Paper presented at the Proceedings of Cambridge 2012: Innovation and Impact - Openly Collaborating to Enhance Education, a joint meeting of OER12 and OpenCourseWare Consortium Global 2012 Cambridge.

Bates, A. W. (2015). Teaching in a digital age. Retrieved from http://opentextbc.ca/teachinginadigitalage/

Belikov, O. M., & Bodily, R. (2016). Incentives and barriers to OER adoption: A qualitative analysis of faculty perceptions. *Open Praxis, 8*(3), 235-246. doi:10.5944/openpraxis.8.3.308

Bergquist, W. H., & Pawlak, K. (2008). *Engaging the six cultures of the academy: Revised and expanded edition of the four cultures of the academy*. San Francisco: Jossey-Bass.

Blodgett, A. T., Schinke, R. J., Smith, B., Peltier, D., & Pheasant, C. (2011). In Indigenous words: Exploring vignettes as a narrative strategy for presenting the research voices of Aboriginal community members. *Qualitative Inquiry, 17*(6), 522-533. doi:10.1177/1077800411409885

Boeije, H. (2010). *Analysis in Qualitative Research* Los Angeles: Sage.

Bogdan, R. C., & Biklen, S. K. (2007). *Qualitative research for education: An introduction to theory and methods* (5th ed.). Boston: Pearson.

Bossu, C., & Fountain, W. (2017). Curriculum design for open education. Retrieved from http://wikieducator.org/Curriculum_design_for_open_education

Bossu, C., & Fountain, W. (n. d.-a). About. Retrieved from http://wikieducator.org/course/Curriculum_design_for_open_education/About/

Bossu, C., & Fountain, W. (n. d.-b). Curriculum design for open education Retrieved from http://wikieducator.org/course/Curriculum_design_for_open_education/

Bozkurt, A., & Akbulut, Y. (2019). Dropout patterns and cultural context in online networked learning spaces. *Open Praxis, 11*(1), 41-54.

Bozkurt, A., Akgun-Ozbek, E., Yilmazel, S., Erdogdu, E., Ucar, H., Guler, E., . . . Aydin, C. H. (2015). Trends in distance education research: A content analysis of journals 2009-2013. *International Review of Research in Open and Distance Learning, 16*(1), 330-363.

Bozkurt, A., Koseoglu, S., & Singh, L. (2018). An analysis of peer reviewed publications on openness in education in half a century: Trends and patterns in the open hemisphere. *Australasian Journal of Educational Technology*. doi:10.14742/ajet.4252

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, Mass: Harvard University Press.

Brown, P., & James, D. (2020). Educational expansion, poverty reduction and social mobility: Reframing the debate. *International Journal of Educational Research, 100*, 101537.
Brundrett, M., & Rhodes, C. (2013). *Researching educational leadership and management: Methods and approaches*. London: Sage.
Bryman, A. (2016). *Social research methods* (Fifth ed.). Oxford: Oxford University Press.
Bryman, A., & Bell, E. (2016). Social research methods: Fourth Canadian edition. Don Mills, ON: Oxford University Press.
Butcher, N. (2011). *A basic guide to open education resources (OER)*. Vancouver: UNESCO & COL.
Butcher, N., & Hoosen, S. (2012). *Exploring the business case for open educational resources*. Vancouver: UNESCO & COL.
Butler-Kisber, L. (2018). Qualitative inquiry: Thematic, narrative and arts-based perspectives (Second Edition ed.). 55 City Road, London: SAGE Publications Ltd. Retrieved from https://methods.sagepub.com/book/qualitative-inquiry-2e. doi:10.4135/9781526417978
Cameron, K. S., & Quinn, R. E. (1999). *Diagnosing and changing organizational culture: Based on the competing values framework*. Reading, MA: Addison-Wesley.
Cameron, K. S., & Quinn, R. E. (2011). *Diagnosing and changing organizational culture: Based on the competing values framework* (3rd ed.). San Francisco, Calif: Jossey-Bass.
Carfagna, L. L. (2018). Learning to share: Pedagogy, open learning, and the sharing economy. *The Sociological Review, 66*(2), 447-465. doi:10.1177/0038026118758551
CAST. (2020). The UDL Guidelines. Retrieved from http://udlguidelines.cast.org/
Change, T. C. f. T. o. (2018). Center for Theory of Change. Retrieved from http://www.theoryofchange.org
Chen, I. (2008). Instructional design methodologies. In T. T. Kidd & H. Song (Eds.), *Handbook of Research on Instructional Systems and Technology* (Vol. 1, pp. 1-14). Hershey, PA: Information Science Reference.
Chiappe, A., & Arias, V. (2015). Understanding reusability as a key factor for open education: A review. *International Review of Research in Open and Distance Learning, 16*(1), 40-56.
Chilisa, B., & Kawulich, B. (2012). Selecting a research approach: Paradigm, methodology and methods. In C. Wagner, B. Kawulich, & M. Garner (Eds.), *Doing social research: A global context* (pp. 51-61).
Clements, K., Pawlowski, J., & Manouselis, N. (2015). Open educational resources repositories literature review – Towards a comprehensive quality approaches framework. *COMPUTERS IN HUMAN BEHAVIOR, 51*, 1098-1106. doi:https://doi.org/10.1016/j.chb.2015.03.026
COEP. (2019). About the national Centre for Open Education Practice. Retrieved from https://coep.nz/about/
Conole, G. (2012). Integrating OER into open educational practices. In J. H. Glennie & N. Butcher (Eds.), *Open educational resources and change in higher education: Reflections from practice* (pp. 111-124).
Conole, G. (2013). *Designing for Learning in an Open World*. New York: Springer
Conole, G., Brasher, A., Cross, S., Weller, M., Clark, P., & Culver, J. (2008). Visualising learning design to foster and support good practice and creativity. *Educational Media International, 45*(3), 177-194. doi:10.1080/09523980802284168
Conole, G., & Brown, M. (2018). Reflecting on the impact of the open education movement. *Journal Of Learning For Development, 5*(3), 187-203.
Conole, G., Oliver, M., Falconer, I., Littlejohn, A., & Harvey, J. (2007). Designing for learning. In G. Conole & M. Oliver (Eds.), *Contemporary perspectives in e-learning research: Themes, methods, and impact on practice* (Vol. 101-120). London: Routledge.
Conole, G., & Wills, S. (2013). Representing learning designs – making design explicit and shareable. *Educational Media International, 50*(1), 24-38. doi:10.1080/09523987.2013.777184
Coughlan, T., Pitt, R., & Farrow, R. (2019). Forms of innovation inspired by open educational resources: A post-project analysis. *Open Learning: The Journal of Open, Distance and e-Learning, 34*(2), 156-175. doi:10.1080/02680513.2018.1552579
Cox, G., & Trotter, H. (2016). Institutional culture and OER policy: How structure, culture, and agency mediate OER policy potential in South African universities. *The International Review Of Research In Open And Distributed Learning, 17*(5).
Cox, G., & Trotter, H. (2017a). Factors shaping lecturers' adoption of OER at three South African universities. In C. Hodgkinson-Williams & P. B. Arinto (Eds.), *Adoption and impact of OER in the Global South* (pp. 287–347).
Cox, G., & Trotter, H. (2017b). An OER framework, heuristic and lens: Tools for understanding lecturers' adoption of OER. *Open Praxis, 9*(2), 151-171.

Creative_Commons. (2019). Kelsey Merkley, "Horizontal Hostility" [Video]. Retrieved from https://www.youtube.com/watch?v=1Y0FuH5FNCo
Creswell, J. W. (2007). *Qualitative inquiry & research design: Choosing among five approaches* (2nd ed.). Thousand Oaks: Sage Publications.
Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4 ed.). Thousand Oaks: Sage.
Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice, 39*(3), 124-130. doi:10.1207/s15430421tip3903_2
Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: Sage.
Cronin, C. (2017). Openness and praxis: Exploring the use of open educational practices in higher education. *The International Review Of Research In Open And Distributed Learning, 18*(5).
Cronin, C., & MacLaren, I. (2018). Conceptualising OEP: A review of theoretical and empirical literature in open educational practices. *Open Praxis, 10*(2), 127-143. doi:10.5944/openpraxis.10.2.825
Davis, N. E. (2018). *Digital technologies and change in education: The arena*. London: Routledge.
Davis, N. E., Eickelmann, B., & Zaka, P. (2013). Restructuring of educational systems in the digital age from a co-evolutionary perspective. *Journal of Computer Assisted Learning, 29*(5), 438-450. doi:10.1111/jcal.12032
Davis, N. E., Harris, L., & Cunningham, U. (2019). Professional ecologies shaping technology adoption in early childhood education with multilingual children. *British Journal of Educational Technology, 50*(3), 1320-1339. doi:10.1111/bjet.12774
Davis, N. E., & Mackintosh, W. (2013, November). A mOOC prepared to make a difference. *DEANZ*.
De Hart, K., Chetty, Y., & Archer, E. (2015). Uptake of OER by staff in distance education in South Africa. *International Review of Research in Open and Distance Learning, 16*(2), 18-45.
DeSimone, R. L., Werner, J. M., & Harris, D. M. (2002). *Human resource development*. Orlando, FL: Harcourt, Inc.
Devi T. V., G. (2019). *Understanding human ecology: Knowledge, ethics and politics*. London: Routledge India.
DeVries, I. (2013). Open course design and development: A case study in the Open Educational Resource University. Retrieved from Retrieved from: summit.sfu.ca/system/files/iritems1/13756/etd8126_IDeVries.pdf
dos Santos, A. I. (2019). Practical guidelines on open education for academics: Modernising higher education via open educational practices. Retrieved from https://ec.europa.eu/jrc/en/publication/practical-guidelines-open-education-academics-modernising-higher-education-open-educational
Drew, C. J., Hardman, M. L., & Hosp, J. L. (2008). Designing and Conducting Research in Education. Thousand Oaks, California: SAGE Publications, Inc. Retrieved from https://methods.sagepub.com/book/designing-and-conducting-research-in-education. doi:10.4135/9781483385648
Dubien, D. (2018). Dear LiDA 103 students. Retrieved from https://edtechchocolaterie.blogspot.co.nz/2018/05/
Dubien, D., Brown, C., Davis, N., & Kamp, A. (2019). *Using open source technologies to design courses for student-student interaction and building elearning skills [Presentation]*. Paper presented at the Pan-Commonwealth forum 9 (PCF9), Edinburgh.
Dunlap, J., & Lowenthal, P. (2018). Online educators' recommendations for teaching online: Crowdsourcing in action. *Open Praxis, 10*(1), 79-89.
Ehlers, U.-D. (2011). Extending the territory: From open educational resources to open educational practices. *Journal of Open, Flexible and Distance Learning, 15*(2), 1-10.
Ely, M., Vinz, R., Downing, M., & Anzul, M. (1997). *On writing qualitative research: Living by words*. London: Falmer Press.
Erstad, O. (2011). Citizens navigating in literate worlds: The case of digital literacy. In M. Thomas (Ed.), *Deconstructing digital natives: Young people, technology and the new literacies* (pp. 99-118). New York, NY: Routledge.
Farshad Nia, S., Davis, N., Cunningham, U., & Howard, J. (2018, 9-11 April). *Digital equity for ESOL students in a New Zealand secondary school analysed with Davis' Arena framework [paper].* Paper presented at the Flexible Learning Association of New Zealand, Palmerston North.
Gay, L. R., Mills, G. E., & Airasian, P. W. (2009). *Educational research: Competencies for analysis and applications* (9 ed.). Upper Saddle River, NJ: Merrill/Pearson.
Gibson, W. J., & Brown, A. (2009). *Working with Qualitative Data*. London: SAGE Publications, Ltd.
Glennie, J., Harley, K., Butcher, N., & van Wyk, T. (2012). *Open educational resources and change in higher education: Reflections from practice*. Vancouver: UNESCO & COL.
Gobo, G. (2008). *Introducing qualitative methods: Doing ethnography* Thousand Oaks: Sage.

Hawkins, J. M. (2017). Thematic analysis. In M. Allen (Ed.), *The SAGE Encyclopedia of Communication Research Methods*. Thousand Oaks: Sage.

Henriksen, D., Richardson, C., & Mehta, R. (2017). Design thinking: A creative approach to educational problems of practice. *Thinking Skills and Creativity, 26*, 140-153. doi:10.1016/j.tsc.2017.10.001

Hilton III, J., Wiley, D., Stein, J., & Johnson, A. (2010). The four 'R's of openness and ALMS analysis: frameworks for open educational resources. *Open Learning: The Journal of Open, Distance and e-Learning, 25*(1), 37-44. doi:10.1080/02680510903482132

Hilton, J. (2016). Open educational resources and college textbook choices: A review of research on efficacy and perceptions. *Educational Technology Research and Development, 64*(4), 573-590. doi:10.1007/s11423-016-9434-9

Hine, C. (2017). From virtual ethnography to the embedded, embodied, everyday internet. In L. Hjorth, H. Horst, A. Galloway, & G. Bell (Eds.), *The Routledge Companion to Digital Ethnography* (pp. 21-28). New York: Routledge.

Hood, N., & Littlejohn, A. (2017). Knowledge typologies for professional learning: Educators' (re)generation of knowledge when learning open educational practice. *Educational Technology Research and Development, 65*(6), 1583-1604. doi:10.1007/s11423-017-9536-z

Hoosen, S., Moore, D., & Butcher, N. (2016). *Open educational resources (OER) guide for students in post-secondary and higher education*. Vancouver: UNESCO & COL.

Hunt, B. D., & Oyarzun, B. (2019). Online Learning Perspectives of Native American Students. *Journal of Educational Technology Systems*, 0047239519867921. doi:10.1177/0047239519867921

hypothes.is. (n. d.). Annotate the web, with anyone, anywhere. Retrieved from https://web.hypothes.is/

ICDE. (n.d.). OERu Micro-Credentials for Macro Impact in Open Online Courses. Retrieved from https://www.icde.org/icde-blog//oeru-micro-credentials-for-macro-impact-in-open-online-courses

Ives, C., & Pringle, M. M. (2013). Moving to open educational resources at Athabasca University: A case study. *International Review of Research in Open and Distance Learning, 14*(2), 1-14.

James, N., & Busher, H. (2012). Internet interviewing. In J. F. Gubrium, J. A. Holstein, A. B. Marvasti, & K. D. McKinney (Eds.), *The SAGE handbook of interview research: The complexity of the craft.* (2nd ed., pp. 177-193). Thousand Oaks: SAGE Publications, Inc.

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robison, A. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge: MIT Press.

Jhangiani, R. (2015). Pilot testing open pedagogy. Retrieved from https://thatpsychprof.com/pilot-testing-open-pedagogy/

Jhangiani, R. (2017). Ditching the "Disposable assignment" in favor of open pedagogy. In W. Altman & L. Stein (Eds.), Essays from E-xcellence in Teaching. Retrieved from http://teachpsych.org/E-xcellence-in-Teaching-Blog.

Johnson, B., & Christensen, L. (2008). *Educational research: Quantitative and qualitative approaches* (3rd ed.). Thousand Oaks: Sage.

Jones, L., & Somekh, B. (2007). *Qualitative research for education: An introduction to theory and methods* (5th ed.). Boston: Pearson.

Kaatrakoski, H., Littlejohn, A., & Hood, N. (2017). Learning challenges in higher education: An analysis of contradictions within Open Educational Practice. *Higher Education, 74*(4), 599-615. doi:10.1007/s10734-016-0067-z

Karunanayaka, S., & Naidu, S. (2018). Designing capacity building of educators in Open Educational Resources integration leads to transformational change. *Distance Education, 39*(1), 87-109. doi:10.1080/01587919.2017.1413933

Karunanayaka, S., Naidu, S., Rajendra, J., & Ratnayake, H. (2015). From OER to OEP: Shifting practitioner perspectives and practices with innovative learning experience design. *Open Praxis, 7*(4), 339-350.

Karunanayaka, S., Naidu, S., Rajendra, J., & Ratnayake, H. (2017). Designing reflective practice in the context of OER-based e-Learning. *Journal Of Learning For Development, 4*(2), 143-160.

Kennepohl, D., Ives, C., & Stewart, B. (2012). Athabasca University: Canada's open university. In D. G. Oblinger (Ed.), *Game changers: Education and information technologies* (pp. 159 -174). Washington, DC: EDUCAUSE.

Kirkness, V., & Barnhardt, R. (2016). First Nations and higher education: The four r's–respect, relevance, reciprocity, responsibility. *Journal of American Indian Education, 30*(3), 1-15.

Kivunja, C., & Kuyini, A. B. (2017). Understanding and applying research paradigms in educational contexts. *International Journal of Higher Education, 6*(5), 26-41.

Kvale, S. (1996). *InterViews: An introduction to qualitive research interviewing*. Thousand Oaks: Sage.

Langer, P. C. (2016). The research vignette: Reflexive writing as interpretative representation of qualitative inquiry—a methodological proposition. *Qualitative Inquiry, 22*(9), 735-744. doi:10.1177/1077800416658066

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. UK: Cambridge University Press.

Lenarduzzi, V., & Taibi, D. (2016). *MVP explained: A systematic mapping study on the definitions of minimal viable product.* Paper presented at the 42nd Euromicro Conference on Software Engineering and Advanced Applications (SEAA).

MacKinnon, T., Pasfield-Neofitou, S., Manns, H., & Grant, S. (2016). A meta-analysis of open educational communities of practice and sustainability in higher educational policy. *Alsic. Apprentissage des Langues et Systèmes d'Information et de Communication, 19*(1).

Mackintosh, W. (2012). Opening education in New Zealand: A snapshot of a rapidly evolving OER ecosystem. In J. Glennie, K. Harley, N. Butcher, & T. v. Wyk (Eds.), *Open educational resources and change in higher education: Reflections from practice* (pp. 263-279). Vancouver: UNESCO & COL.

Mackintosh, W. (2016a). Digital skills for collaborative OER development/Design blueprint/Open design. Retrieved from http://wikieducator.org/Digital_skills_for_collaborative_OER_development/Design_blueprint/Open_design

Mackintosh, W. (2016b). Wayne Mackintosh. Retrieved from https://www.youtube.com/user/mackiwg

Mackintosh, W. (2017). Open course development at the OERu. In R. Jhangiani & R. Biswas-Diener (Eds.), *Open: The philosophy and practices that are revolutionizing education and science* (pp. 101-114). London: Ubiquity Press.

Mackintosh, W. (2018). Announcement of LiDA101 launch. Retrieved from https://twitter.com/Mackiwg/status/963955529444835328

Mackintosh, W. (2019). @Mackiwg. Retrieved from https://twitter.com/Mackiwg

Marginson, S. (2016). The worldwide trend to high participation higher education: Dynamics of social stratification in inclusive systems. *Higher Education, 72*(4), 434;413;-434. doi:10.1007/s10734-016-0016-x

McGreal, R., Anderson, T., & Conrad, D. (2015). Open educational resources in Canada 2015. *International Review of Research in Open and Distance Learning, 16*(5), 161-175.

McGreal, R., Miao, F., & Mishra, S. (2016). Open Educational Resources: Policy, Costs and Transformation. In F. Miao, S. Mishra, & R. McGreal (Eds.), *Open Educational Resources: Policy, Costs and Transformation* (pp. 1-11). Burnaby, Canada: UNESCO and COL.

McKerlich, R., Ives, C., & McGreal, R. (2013). Measuring use and creation of open educational resources in higher education. *International Review of Research in Open and Distance Learning, 14*(4), 90-103.

McNay, I. (1995). From collegial academy to corporate enterprise: The changing cultures of universities. In T. Schuller (Ed.), *The Changing University?* (pp. 105-115). Buckingham, UK: Society for Research into Higher Education and Open University Press.

Merriam, S. B., & Simpson, E. L. (1995). *A guide to research for educators and trainers of adults* (2nd ed.). Malabar, Fla: Krieger Pub. Co.

Miao, F., Mishra, S., & McGreal, R. (Eds.). (2016). *Open educational resources: Policy, costs, transformation*. Vancouver: UNESCO & COL.

Mills, D., & Morton, M. (2013). *Ethnography in education*. London: Sage.

Miyazoe, T., & Anderson, T. (2010). The interaction equivalency theorem. *Journal of Interactive Online Learning, 9*(2), 94-104.

Morse, J. M. (1995). The significance of saturation. . *Qualitative Health Research, 5*(2), 147-149.

Murphy, A. (2013). Open educational practices in higher education: Institutional adoption and challenges. *Distance Education, 34*(2), 201-217. doi:10.1080/01587919.2013.793641

n.a. (n. d.). OpenETC: Free range edtech. Retrieved from https://opened.ca/

Nascimbeni, F., Burgos, D., Campbell, L. M., & Tabacco, A. (2018). Institutional mapping of open educational practices beyond use of Open Educational Resources. *Distance Education, 39*(4), 511-527. doi:10.1080/01587919.2018.1520040

New_Zealand_Government. (2014). New Zealand government open access and licensing (NZGOAL) framework. Retrieved from https://www.ict.govt.nz/assets/Uploads/NZGOAL-Version-2.pdf

New_Zealand_Government. (2017). New Zealand welcomes first micro-credentials. Retrieved from https://www.beehive.govt.nz/release/new-zealand-welcomes-first-micro-credentials

New_Zealand_Government. (2018). New Zealand National Statement to United Nations General Assembly. Retrieved from https://www.beehive.govt.nz/speech/new-zealand-national-statement-united-nations-general-assembly

O'Reilly, K. (2009). Key Concepts in Ethnography. London: SAGE Publications Ltd. Retrieved from https://methods.sagepub.com/book/key-concepts-in-ethnography. doi:10.4135/9781446268308
OER_Foundation. (2015). Open Education Resource Foundation. Retrieved from http://wikieducator.org/OERF:About
OERu. (2010). CollabOERate.
OERu. (2013). Introduction and course aims. Retrieved from http://wikieducator.org/Open_content_licensing_for_educators/Course_guide/Introduction
OERu. (2014a). 2011.11 OERu Meeting summary. Retrieved from https://wikieducator.org/OERu/2011.11_OERu_Meeting_summary
OERu. (2014b). OERu context evaluation. Retrieved from https://wikieducator.org/OERu/Planning/OERu_context_evaluation
OERu. (2014c). OERu partners and course design and development manual. Retrieved from http://wikieducator.org/OERu/Planning/Develop_an_OERu_partners_manual
OERu. (2014d). Open content licensing for educators. Retrieved from http://wikieducator.org/Open_content_licensing_for_educators/Home
OERu. (2015a). 2015 Institutional Action Plans. Retrieved from http://wikieducator.org/OERu/Planning/2015_Institutional_Action_Plans
OERu. (2015b). Core principles of engagement. Retrieved from http://wikieducator.org/OERu/Core_principles_of_engagement
OERu. (2015c). Digital skills for collaborative OER development/Course description. Retrieved from http://wikieducator.org/Digital_skills_for_collaborative_OER_development/Course_description
OERu. (2015d). OER university discussion and planning channels. Retrieved from http://wikieducator.org/OERu/Communications
OERu. (2015e). The OERu Council of Chief Executive Officers Retrieved from http://wikieducator.org/OERu/OERu_Council_of_CEOs
OERu. (2015f). OERu/Planning/2015 course development/Course Summary 2015 template. Retrieved from http://wikieducator.org/OERu/Planning/2015_course_development/Course_Summary_2015_template
OERu. (2015g). OERu/Planning/2015 course development/Design blueprint 2015 template. Retrieved from http://wikieducator.org/OERu/Planning/2015_course_development/Design_blueprint_2015_template
OERu. (2015h). OERu/Planning/Develop an OERu partners manual/Brainstorm and discuss provisional table of contents for partners manual. Retrieved from http://wikieducator.org/OERu/Planning/Develop_an_OERu_partners_manual/Brainstorm_and_discuss_provisional_table_of_contents_for_partners_manual
OERu. (2015i). Posted minutes of the 2nd meeting. Retrieved from http://groups.oeru.org/groups/oeru-curriculum-and-programme-of-study/messages/topic/mUrG7u1frEB8zRX9Ydlf1/
OERu. (2015j). Quicklinks for OERu developers. Retrieved from http://wikieducator.org/OERu/Planning/Quicklinks_for_OERu_developers
OERu. (2015k). Talk:OERu/Home. Retrieved from http://wikieducator.org/Talk:OERu/Home
OERu. (2016a). About the OERu. Retrieved from https://course.oeru.org/2016-meetings/about/about-the-oeru/
OERu. (2016b). Crowdsourcing topics for inclusion in the Learning in a Digital Age (LiDA) course. Retrieved from http://groups.oeru.org/groups/lida-course-team/messages/topic/7dmqEphNaBlF8hyi34DuA2/
OERu. (2016c). Digital skills for collaborative OER development. Retrieved from https://course.oeru.org/ds4oer/
OERu. (2016d). Digital skills for collaborative OER development/ Outline. Retrieved from http://wikieducator.org/Digital_skills_for_collaborative_OER_development/_Outline
OERu. (2016e). Documentation:Digital Toolbox. Retrieved from https://kumu.tru.ca/Documentation:Digital_Toolbox
OERu. (2016f). Improving OERu operations. Retrieved from https://course.oeru.org/2016-meetings/partners-meeting/day-1/improving-oeru-operations/
OERu. (2016g). Learning in a digital age/1st Meeting. Retrieved from http://wikieducator.org/Learning_in_a_digital_age/1st_Meeting
OERu. (2016h). Learning in a digital age/Crowdsourcing topics for LiDA. Retrieved from http://wikieducator.org/Learning_in_a_digital_age/Crowdsourcing_topics_for_LiDA
OERu. (2016i). Learning in a digital age/LIDA100 OERu course specification. Retrieved from http://wikieducator.org/Learning_in_a_digital_age/LIDA100_OERu_course_specification

OERu. (2016j). LiDA 16-06 Course team meeting [Video]. Retrieved from https://www.youtube.com/watch?v=OgzBMa3Fll8
OERu. (2016k). OERu16-10 Improving operations [Video]. Retrieved from https://www.youtube.com/watch?v=oZF1af5Pg0w
OERu. (2016l). OERu 16-10 - Critical friend review [Video]. Retrieved from https://www.youtube.com/watch?v=-h9P8seFop0
OERu. (2016m). OERu 16-11 Oceania meeting agenda consultation (Part A). Retrieved from https://www.youtube.com/watch?v=3hVQioeRirQ&
OERu. (2016n). OERu 16-11 Oceania meeting agenda consultation (Part B). Retrieved from https://www.youtube.com/watch?v=g4eKPQMpumI&
OERu. (2016o). OERu 16.10 Council of Chief Executive Officers meeting report. Retrieved from http://wikieducator.org/OERu/OERu_16.10_Council_of_CEOs/Report
OERu. (2016p). OERu 16.10 partner's meeting report. Retrieved from http://wikieducator.org/OERu/OERu_16.10_Meeting/Report
OERu. (2016q). OERu 2016-09 - Planning the agenda for 2016 Partners meeting [Video]. Retrieved from https://www.youtube.com/watch?v=09Jy7YWfi1E
OERu. (2016r). OERu 2016-10 draft agenda. Retrieved from http://wikieducator.org/OERu/Planning/OERu_2016-10_draft_agenda
OERu. (2016s). OERu 2016 Meetings. Retrieved from https://course.oeru.org/2016-meetings/
OERu. (2016t). OERu planning hub. Retrieved from http://wikieducator.org/OERu/Planning
OERu. (2016u). OERu/Oceania OERu 16.11 regional meeting. Retrieved from http://wikieducator.org/OERu/Oceania_OERu_16.11_regional_meeting
OERu. (2016v). OERu/Oceania OERu 16.11 regional meeting/Agenda consultation meeting. Retrieved from http://wikieducator.org/OERu/Oceania_OERu_16.11_regional_meeting/Agenda_consultation_meeting
OERu. (2016w). OERu/Oceania OERu 16.11 regional meeting/Agenda consultation meeting. Retrieved from http://wikieducator.org/OERu/Oceania_OERu_16.11_regional_meeting/Agenda_consultation_meeting
OERu. (2016x). OERu/OERu 16.10 Meeting/CEOs agenda. Retrieved from http://wikieducator.org/OERu/OERu_16.10_Meeting/CEOs_agenda
OERu. (2016y). OERu/OERu 16.10 Meeting/Confirmed participants. Retrieved from http://wikieducator.org/OERu/OERu_16.10_Meeting/Confirmed_participants
OERu. (2016z). OERu/OERu 16.10 Meeting/Issues for CEOs meeting. Retrieved from http://wikieducator.org/OERu/OERu_16.10_Meeting/Issues_for_CEOs_meeting
OERu. (2016aa). OERu/Planning/Course approval and quality working group. Retrieved from http://wikieducator.org/OERu/Planning/Course_approval_and_quality_working_group
OERu. (2016ab). OERu/Planning/Curriculum programme of study and quality. Retrieved from http://wikieducator.org/OERu/Planning/Curriculum_programme_of_study_and_quality
OERu. (2016ac). #oerulida. Retrieved from https://twitter.com/hashtag/oerulida
OERu. (2016ad). Open consultation - Meeting agenda for the OERu 2016-10 meetings. Retrieved from http://groups.oeru.org/groups/oeru-partner-engagement/messages/topic/5GIfpEPx1DlshjmN9jCUyL/
OERu. (2016ae). Open consultation - Meeting agenda for the OERu 2016-10 meetings. Retrieved from http://groups.oeru.org/groups/oeru-management-committee/messages/topic/68qJI6AwTdgqVqRNr1YvPY/
OERu. (2016af). Open consultation - Meeting agenda for the OERu 2016-10 meetings. Retrieved from http://groups.oeru.org/groups/oeru-focal-points/messages/topic/2qU4lgQJqz4V11G5RGKvdn
OERu. (2016ag). Style guide. Retrieved from http://wikieducator.org/OERu/Style_guide
OERu. (2016ah). Taking stock and meeting priorities. Retrieved from https://course.oeru.org/2016-meetings/partners-meeting/day-1/taking-stock-and-meeting-priorities/
OERu. (2017a). Learning in a digital age. Retrieved from https://plan.oeru.org/b/xvNXqS4ob3qGRFP9W/learning-in-a-digital-age
OERu. (2017b). Learning in a Digital Age course team. Retrieved from http://groups.oeru.org/groups/lida-course-team
OERu. (2017c). Learning in a digital age/Curriculum planning. Retrieved from http://wikieducator.org/Learning_in_a_digital_age/Curriculum_planning
OERu. (2017d). LiDA Curriculum storyboard. Retrieved from http://plan.oeru.org/b/YZCc6CY3cf9Q4RZQn/lida-curriculum-story-board
OERu. (2017e). OERu 17.10 partner's meeting report.

OERu. (2017f). OERu 2017 Meetings. Retrieved from https://course.oeru.org/2017-meetings/
OERu. (2017g). OERu/OERu 17.10 Council of CEOs/Report. Retrieved from http://wikieducator.org/OERu/OERu_17.10_Council_of_CEOs/Report
OERu. (2017h). OERu/OERu 17.10 Meeting/CEOs agenda. Retrieved from http://wikieducator.org/OERu/OERu_17.10_Meeting/CEOs_agenda
OERu. (2017i). OERu/OERu 17.10 Meeting/Confirmed participants. Retrieved from https://wikieducator.org/OERu/OERu_17.10_Meeting/Confirmed_participants
OERu. (2017j). Terms of reference for the OERu Council of CEOs. Retrieved from http://wikieducator.org/OERu/OERu_13.11_Council_of_CEOs/draft_terms_of_reference
OERu. (2018a). Groups.OERu. Retrieved from http://groups.oeru.org/
OERu. (2018b). Learning in a digital age planning page. Retrieved from http://wikieducator.org/Learning_in_a_digital_age
OERu. (2018c). Meetings. Retrieved from http://wikieducator.org/OERu/Meetings
OERu. (2018d). # oer-course-dev. Retrieved from https://chat.oeru.org/channel/oer-course-dev
OERu. (2018e). OER universitas. Retrieved from https://www.youtube.com/channel/UCCMLj7wLhilYq_CH84D_TPg
OERu. (2018f). OERu 18.11 partners' meeting report. Retrieved from http://wikieducator.org/OERu/OERu_18.11_Meeting/Report
OERu. (2018g). OERu 2018 Council of Chief Executive Officers meeting report. Retrieved from http://wikieducator.org/OERu/OERu_18.11_Council_of_CEOs/Report
OERu. (2018h). *OERu 2018 mid-year report*. Retrieved from Dunedin, New Zealand: https://wikieducator.org/images/c/c2/OERu_-_2018_Mid_year_report.pdf
OERu. (2018i). OERu Chat. Retrieved from https://chat.oeru.org
OERu. (2018j). OERu Google Group. Retrieved from https://groups.google.com/forum/#!forum/oeru
OERu. (2018k). OERu quality review project. Retrieved from http://wikieducator.org/OERu/Planning/Quality_review_project
OERu. (2018l). OERu working groups: Curriculum and quality group. Retrieved from https://community.oeru.org/c/groups/curriculum-quality-group
OERu. (2018m). OERu/OERu 18.11 Meeting/CEOs agenda. Retrieved from https://wikieducator.org/OERu/OERu_18.11_Meeting/CEOs_agenda
OERu. (2018n). OERu/OERu 18.11 Meeting/Confirmed participants. Retrieved from http://wikieducator.org/OERu/OERu_18.11_Meeting/Confirmed_participants
OERu. (2018o). OERu/OERu 18.11 Meeting/Schedule. Retrieved from https://wikieducator.org/OERu/OERu_18.11_Meeting/Schedule
OERu. (2018p). @OERuniversitas. Retrieved from https://www.facebook.com/OERuniversitas/
OERu. (2018q). Open education, copyright and open licensing in a digital world. Retrieved from https://course.oeru.org/lida103/
OERu. (2018r). Open pedagogy and open boundary courses Retrieved from http://wikieducator.org/images/d/df/OERu18-11_Session_5_Open_pedagogy.pdf
OERu. (2018s). Open Recordings. Retrieved from https://www.youtube.com/channel/UCxYg12mfqXdEUR7xhEg3BiQ
OERu. (2018t). Otago Polytechnic boosts staff capacity for OERu micro-credentials. Retrieved from https://oeru.org/news/otago-polytechnic-boosts-staff-capacity-for-oeru-micro-credentials/
OERu. (2019a). OERu Community. Retrieved from https://community.oeru.org/
OERu. (2019b). OERu feed.
OERu. (n. d.-a). About the OERu.
OERu. (n. d.-b). Courses. Retrieved from https://oeru.org/courses/
OERu. (n. d.-c). Master the Basics of Digital Age Creative Commons. Retrieved from https://mautic.oeru.org/lida103-landing-page-aquaduct
OERu. (n. d.-d). OERu bookmarks. Retrieved from https://bookmarks.oeru.org
OERu. (n. d.-e). OERu Forums all categories lida103. Retrieved from https://forums.oeru.org/tags/lida103
OERu. (n. d.-f). OERu partners.
OERu. (n. d.-g). Open content licensing for educators. Retrieved from http://wikieducator.org/course/OCL4Ed/
OERu. (n.d.-a). Introduction to ecosystems. Retrieved from https://oeru.org/oeru-partners/the-open-university/introduction-to-ecosystems/

OERu. (n.d.-b). Strategic planning for success. Retrieved from https://oeru.org/oeru-partners/otago-polytechnic/strategic-planning-for-success/
OERu_Technology. (2018a). Blog posts. Retrieved from https://tech.oeru.org/blog
OERu_Technology. (2018b, May 5 2018). Insight: what does the Open Source Technologist at the OER Foundation do? Retrieved from https://tech.oeru.org/insight-what-does-open-source-technologist-oer-foundation-do
OPAL. (2011). *Beyond OER: Shifting focus to open educational practices. OPAL Report 2011.* Essen, Germany: Open Education Quality Initiative.
Opensource.org. (2007). The open source definition. Retrieved from https://opensource.org/osd
Otto, D. (2019). Adoption and Diffusion of Open Educational Resources (OER) in Education: A meta-analysis of 25 OER-projects. *International Review of Research in Open and Distributed Learning, 20*(5), 122-140.
Paskevicius, M. (2017). Conceptualizing open educational practices through the lens of constructive alignment. *Open Praxis, 9*(2), 125-140.
QualityMatters. (2020). Course Design Rubric Standards. Retrieved from https://www.qualitymatters.org/qa-resources/rubric-standards/higher-ed-rubric
Raymond, E. (1999). The cathedral and the bazaar. *Knowledge, Technology & Policy, 12*(3), 23-49. doi:10.1007/s12130-999-1026-0
Rodés, V., Gewerc-Barujel, A., & Llamas-Nistal, M. (2019). University Teachers and Open Educational Resources: Case Studies from Latin America. *The International Review Of Research In Open And Distributed Learning, 20*(1). doi:10.19173/irrodl.v20i1.3853
Rogers, E. M. (2003). *Diffusion of innovations* (5 ed.). New York: Free Press.
Rolfe, V. (2012). Open educational resources: Staff attitudes and awareness. *Research In Learning Technology, 20*(1), 1-13. doi:10.3402/rlt.v20i0/14395
Roulston, K. (2010). *Reflective interviewing: A guide to theory and practice*. Los Angeles: Sage.
Sandanayake, T. C. (2019). Promoting open educational resources-based blended learning. *International Journal of Educational Technology in Higher Education, 16*(1), 3. doi:10.1186/s41239-019-0133-6
Sangrá, A., Raffaghelli, J. E., & Guitert-Catasús, M. (2019). Learning ecologies through a lens: Ontological, methodological and applicative issues. A systematic review of the literature. *British Journal of Educational Technology, 50*(4), 1619-1638. doi:10.1111/bjet.12795
Schein, E. H. (1990a). *Organizational culture* (Vol. 45): American Psychological Association.
Schein, E. H. (1990b). Organizational culture: What it is and how to change it *Human resource management in international firms* (pp. 56-82): Springer.
Schein, E. H., & Schein, P. (2016). *Organizational culture and leadership* (5th ed.). Hoboken, New Jersey: John Wiley and Sons, Inc.
Schreurs, B., Van den Beemt, A., Prinsen, F., Witthaus, G., Conole, G., & de Laat, M. (2014). An investigation into social learning activities by practitioners in open educational practices. *International Review of Research in Open and Distance Learning, 15*(4), 2-20.
Scott, J. (1990). *A matter of record: Documentary sources in social research*. Cambridge, MA: Polity Press.
Silverman, D. (2013). *Doing qualitative research: A practical handbook* (Fourth edition ed.). London: SAGE.
Spalding, N. J., & Phillips, T. (2007). Exploring the use of vignettes: From validity to trustworthiness. *Qualitative Health Research, 17*(7), 954-962. doi:10.1177/1049732307306187
Spradley, J. (1979). *The Ethnographic Interview*. Fort Worth, TX: Harcourt Brace Jovanovich College.
Stagg, A. (2017). The ecology of the open practitioner: A conceptual framework for open research. *Open Praxis, 9*(4), 363-374. doi:10.5944/openpraxis.9.4.662
Steiner, F. R. (2016). *Human ecology: How nature and culture shape our world*. Washington: Island Press.
Surman, M. (2008a, Feb 28 2008). https://commonspace.wordpress.com/about/ Retrieved from https://commonspace.wordpress.com/about/
Surman, M. (2008b). Open, philanthropy and a theory of change. Retrieved from https://commonspace.wordpress.com/2008/02/28/open-philanthropy-and-a-theory-of-change/
Taylor, S. J., Bogdan, R., & DeVault, M. L. (2016). *Introduction to qualitative research methods: A guidebook and resource* (4 ed.). New Jersey: Wiley.
Tertiary_Education_Commission_NZ. (2014). Technological developments and tertiary education delivery models: The arrival of MOOCs Retrieved from http://www.educationcounts.govt.nz/__data/assets/pdf_file/0003/146856/Massive-Open-Online-Courses.pdf
Tohatoha. (n.d.). Tohatoha Aotearoa Commons. Retrieved from https://www.tohatoha.org.nz/

Tur, G., Havemann, L., Marsh, D., Keefer, J. M., & Nascimbeni, F. (2020). Becoming an open educator: towards an open threshold framework. *Research In Learning Technology, 28*.

Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review, 3*(2), 130-154. doi:10.1016/j.edurev.2007.12.001

UNESCO. (2019). DRAFT Recommendation on Open Educational Resources (OER). Retrieved from https://drive.google.com/file/d/1N54rMUsvVO-9f1K-LN-pmkBQSto2wLRu/view

UNESCO, & COL. (2015). *Guidelines for open educational resources (OER) in higher education.* Vancouver: UNESCO & COL.

Vázquez-Cano, E., Martín-Monje, E., & Castrillo de Larreta-Azelain, M. D. (2016). Analysis of PLEs' Implementation under OER Design as a Productive Teaching-Learning Strategy in Higher Education. A Case Study at Universidad Nacional de Educación a Distancia. *Digital Education Review, 29*, 62-85.

Waycott, J., Sheard, J., Thompson, C., & Clerehan, R. (2013). Making students' work visible on the social web: A blessing or a curse? *Computers & Education, 68*, 86-95. doi:https://doi.org/10.1016/j.compedu.2013.04.026

Waycott, J., Thompson, C., Sheard, J., & Clerehan, R. (2017). A virtual panopticon in the community of practice: Students' experiences of being visible on social media. *The Internet and Higher Education, 35*, 12-20. doi:10.1016/j.iheduc.2017.07.001

Weller, M., Jordan, K., DeVries, I., & Rolfe, V. (2018). Mapping the open education landscape: Citation network analysis of historical open and distance education research. *Open Praxis, 10*(2), 109-126. doi:10.5944/openpraxis.10.2.822

Wiley, D. (2017). OER-enabled pedagogy. Retrieved from https://opencontent.org/blog/archives/5009

Wiley, D., Bliss, T. J., & McEwen, M. (2014). Open educational resources: A review of the literature. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 781–789).

Wolfenden, F., Buckler, A. S. H., & Keraro, F. (2012). OER adaptation and reuse across cultural contexts in Sub-Saharan Africa: Lessons from TESSA (Teacher Education in Sub-Saharan Africa). *Journal of Interactive Media in Education, 2012*(1). doi:10.5334/2012-03

Woodward, K. M. (2017). Building a path to college success: Advocacy, discovery and OER adoption in emerging educational models. *Journal of Library & Information Services in Distance Learning, 11*(1-2), 206-212.

Wyles, R. (2006). *New Zealand Open Source Virtual Learning Environment project- A case study in achieving National Development Goals using Open Educational Resources*. Paper presented at the PCF4, Ocho Rios, Jamaica.

Yin, R. K. (2014). *Case study research: Design and methods* (5 ed.). Los Angeles: Sage.

Zawacki-Richter, O., Bäcker, E. M., & Vogt, S. (2009). Review of distance education research (2000 to 2008): Analysis of research areas, methods, and authorship patterns. *International Review of Research in Open and Distance Learning, 10*(6), 21-50.

Appendix 1. Table of empirical studies

An analysis of empirical studies reviewed in chapter 3 based on the research question, "How can the design and development of courses using OERs be improved for use in tertiary education institutions that implement OEPs?"

Document title	Citation	Research	Framework	Significant findings or recommendations
Opening teaching landscapes: The importance of quality assurance in the delivery of open educational resources.	Atenas, Haveman n, & Priego, 2014	Survey with 350 global respondents, 20 interviews	No	"Collaboration, Searching, Repurposing and Translation were the top four features experts considered could make ROER successful" p. 40. The authors feel that OER engagement will develop through these skills and then lead to necessary skills development in "critical assessment and quality assurance of OER".
Open educational practices and technology appropriation: The case of the Regional Open Latin American Community for Social and Educational Research (CLARISE)	Betancour t, Ramírez, & Montoya 2014	case study to examine how open educational practices (OEPs) and technology appropriation develop in teachers belonging to a virtual academic network	Several frameworks were used to categorise how the network participants engaged with different aspects of open education: mobilising knowledge, OEP maturity, technology appropriation, level of participation.	The network promotes the exchange of educational and research resources, collaborative development. The network also promotes professional development in using OEPs and OERs. The members of this network appropriate technology to find, use, and reuse OER, but not for repurposing them.
Forms of innovation inspired by	Coughlan, Pitt, & Farrow,	Examination of forms of innovation involving OER	Diffusion of Innovations model (Rogers, 2010)	The authors found that existing models of innovation did not suffice for examining OER innovation in all of its complexity.

open educational resources: A post-project analysis.	2019	The research involved retrospective interviews and focus groups plus document analysis. There were 20 participants from 7 institutions. The authors focused "on how practitioners understood the impact of the OER-related activities with which they had been involved" p.172.	SAMR (Substitution, Augmentation, Modification, Redefinition) Puentedura, 2006 Task-Artefact Cycle (Carroll, Kellogg, & Rosson, 1991)	The authors proposed three types of innovation that are related to each other: Specific Adoption; Preferred Practise and Foundations for Innovation. Each form of innovation has enablers and barriers to the other two forms. The use of OER stimulates a change in educational practices.
Institutional culture and OER policy: How structure, culture, and agency mediate OER policy potential in South African universities	Cox & Trotter, 2016	The authors examined organizational culture to see which would most effectively motivate OER engagement. The authors interviewed 6 academics from each of 3 very different South African universities that are representative of the country' tertiary education institutions.	Frameworks for analyzing organizational culture (OC): McNay (1995) based on policy Types of OC: collegium, bureaucracy, enterprise, corporation Bergquist and Pawlak (2008) have a broader definition of OC.2 of their 6 types were used in this research: collegial and managerial. Margaret Archer's (2003) theory of social realism. Organizational culture has three components: policy structure, social culture, and individual agency.	Some policies might act simply as a "hygienic" factor (a necessary but not sufficient variable in promoting OER activity) while others might act as a "motivating" factor (incentivizing OER activity either among individual academics or the institution as a whole). The authors found that policy acts as a hygienic factor when it simply allows for OER engagement. Both hygienic and motivating factors are required for OER engagement to be sustainable.
Factors shaping lecturers' adoption of OER at three South African universities	Cox & Trotter, 2017b	This research is part of the same project as Cox & Trotter (2016) In addition to the interviews mentioned above, the		The authors develop the OER adoption pyramid and OER adoption readiness tables to describe institutions' OER engagement. "Findings indicate that whether and how OER adoption takes place at an institution

		authors used a survey whose results were not presented in this article.		is shaped by a layered sequence of factors – infrastructural access, legal permission, conceptual awareness, technical capacity, material availability, and individual or institutional volition – which are further influenced by prevailing cultural and social variables" p. 287 Organizational culture does not influence the readiness to use OER. Instead, it indicates the kinds of activities faculty can take on most easily when engaging with OER. "the "openness" of an OER is rarely more important than the practical, pedagogical concerns surrounding any educational materials' relevance and quality in terms of a specific intended use" p. 338
Openness and praxis: Exploring the use of open educational practices in tertiary education.	Cronin, 2017	Semi-structured interviews with 19 educators from a variety of subjects at one Irish university. The research examined the extent to which faculty use OER, why, and how.	constructivist grounded theory (Charmaz, 2014) Archer's (2003) social realist theory Sociocultural theory (Lewis, Enciso & Moje, 2007).	"a model of the concept "Using OEP for teaching" was constructed showing four dimensions shared by open educators: balancing privacy and openness, developing digital literacies, valuing social learning, and challenging traditional teaching role expectations" p. 15 "Analysis showed that participants sought to balance privacy and openness in their use of social and participatory technologies at four levels: macro (global level), meso (community/network level), micro (individual level), and nano (interaction level). Differentiating between these levels proved helpful in understanding decision-making around open practices" p. 25. Institutional policies alone do not guarantee that OEP implementation will be successful or sustainable. Thus, the author recommends that institutions address the dimensions of her model and work collaboratively for OEP implementation to occur.

MOOC-making and open educational practices	Czerniewicz, Andrew, Michael, & Sukaina, 2017	Embedded observation, observation of the process of developing MOOCs, semi-structured interviews, focus groups, and collection of artefacts	Activity Theory (Engeström 1987), "Hodgkinson-Williams' (2014) dimensions of openness […] • technical openness (e.g., interoperability and open formats, technical skill and resources, availability and discoverability); • legal openness (e.g., open licensing knowledge and advice); • cultural openness (e.g., knowledge on a continuum between homogenous and diverse) and curriculum (on a continuum between institutionalised and autonomous); • pedagogical openness (e.g., student demographics and types of engagement). • financial openness (e.g., whether OER should be free or not, funding arrangements)" p. 84 "Beetham et al.'s six features of paradigmatic open practices are: • opening up content to students not formally enrolled; • sharing and collaborating on content with practitioners; • reusing content in teaching contexts;	"contradictions regarding creation and adoption of OER in the MOOCs emerged and while partially resolved, suggest the value of expanding considerations of OEP beyond legal adherence thus capturing a wider range of emerging practices. There are also indications that through engaging open education practices, a better understanding of open educational resources and their value comes to light" p. 95.

			• using or encouraging others to use open content; • making knowledge publicly accessible; • teaching learning in open networks" p.84 The authors combined and condensed the two frameworks into one with these four dimensions: "legal openness; pedagogic openness and learning in open networks; encouraging others to teach and learn in open networks and reusing content in teaching/other contexts" p. 84	
Uptake of OER by Staff in Distance Education in South Africa	De Hart, Chetty, Archer 2015	Survey about OER uptake by staff Open-ended and close-ended questions This is a follow-up to Chetty & Archer, 2011	Roger's (2003) 5 Stages of the Innovation Adoption Process	Awareness of OER is high (73.5%) at this institution. "some Innovators and Early Adopters have moved towards the Decision and Implementation stage, the majority of Unisa staff are still grappling with the Persuasion and Decision stages" p. 41 This system of OER engagement is not yet at a high enough stage of adoption to be sustainable, according to the authors.
Knowledge typologies for professional learning: Educators' (re)generation of knowledge when learning open educational	Hood & Littlejohn, 2017	Survey of 521 European educators, followed up with 30 semi-structured interviews in a study to "develop guidelines for structuring learning and teaching opportunities relevant to educators' open educational resource (OER) engagement" p. 2	Tynjälä's (2008) Integrative Pedagogies model for developing professional expertise	The authors describe six types of knowledge for developing innovative practices: • general conceptual/theoretical knowledge • specific conceptual/theoretical knowledge • practical/experiential knowledge • self-regulative knowledge • socio-cultural knowledge (community based) • socio cultural knowledge (workplace based) The authors promote a variety of methods of learning

practice.				and reflection to enhance professional development. From the first to the last types of knowledge listed above, the trend is to increase in generalizability and to decrease in depth. The authors distinguish between knowledge that can be taught and knowledge and skills that must be acquired while completing practical tasks.
Learning challenges in tertiary education: An analysis of contradictions within Open Educational Practice.	Kaatrakoski, Littlejohn, & Hood, 2017	This research is part of the same study as Hood & Littlejohn (2017) Survey of 521 European educators, followed up with 30 semi-structured interviews with an interest in exploring "explore the challenges adult education practitioners encounter when changing their practice" p. 599	Wild's (2012) ladder of OER engagement: none, piecemeal, strategies, embedded. theory of self-regulated learning (Zimmerman 2000) and cultural–historical activity theory (Engestro¨m 1987) Discursive manifestations of contradictions Engeström's and Sannino's (2011)	The authors used Engeström's and Sannino's (2011) Discursive manifestations of contradictions to identify "three distinct tensions in tertiary education educators' practice: tensions between the emerging needs of the individual (as he or she adopts new forms of practice) and organizational policies; between the transfer of responsibilities from educators to students as new practice is embedded and institutional accountability; and between cost efficiency and learning objectives" p. 599. This approach was practical for detecting tensions "at the individual, network and institutional level" p. 611.
From OER to OEP: Shifting practitioner perspectives and practices with innovative learning experience design.	Karunanayaka, Naidu, Rajendra, & Ratnayake, 2015	Case study including questionnaires, mapping exercise, analysis of discussion posts and of self-reflections, focus groups. 35 participants (18 females and 17 males) were involved in professional development activities designed by the researchers. Data was collected over 6 months.	Ehlers' (2011) OPAL framework Ehlers' (2011) Diffusion of Open Educational Practices The professional development program was based on Scenario-based learning (SBL).	The authors found that "capacity building occurred in different ways, in terms of development of new knowledge, thinking, perceptions, attitudes and skills, and specifically in the following aspects: understanding around key concepts related to OER and their relationships; skills in identifying, evaluating, adapting, developing and integrating OER in teaching and learning; competency in OER-based online course design; and confidence in applying the new knowledge and skills in their professional practice" p. 345. 20 participants (29%) completed the course. The authors referred to Rogers' (2003) framework to suppose that those who completed the program are more open to adaptation while the remainder of the participants required more support and time.

				The participants agreed that the discussion forum was the most useful tool in the course, and the authors suggested that application of and reflection on the course content, plus tutorial support, helped the participants to make the most of this course. This course helped the participants to go from a more passive or non-existent role in OER engagement to a more active role in OEP implementation.
Designing reflective practice in the context of OER-based e-Learning	Karunanayaka, Naidu, Rajendra, & Ratnayake, 2017	This research is based on the same study as Karunanayaka, Naidu, Rajendra, & Ratnayake (2015). Self-reflections, focus group interviews, questionnaires with 35 participants with the aim of exploring "how a systematic design of reflective practice within the context of a professional development online course on how OER-based e-Learning, impacted promoting, supported reflective practice among educators and fostered their adoption of OEP"	The professional development program was based on Scenario-based learning (SBL). "Scenario-based Learning (SBL) is a model of situated learning that is grounded in constructivist pedagogy (Duffy & Jonnasen, 1991)." p. 145. "Donald Schön's (1983) model focuses on reflective practice as a means for professional growth and on the role of the reflective practitioners in terms of two aspects — learning to reflect 'in' action (RIA) and reflect 'on' action (ROA) (Munby, 2012). RIA is 'thinking on your feet' or reflecting while engaging in an action, and ROA is 'looking back' or reflecting after the completion of an action or an experience (Schön, 1983)" p.145	Reflective practice was enhanced by the SBL approach as well as the communication tasks (mapping, discussions, etc.) "These strategies have also helped enhance their critical thinking, creativity, collaborative learning as well as self-esteem, and helped promote a shift towards open education practices, despite the constraints of time" p.157. Many participants remarked that some tasks took more time to complete than estimated. Those tasks were the ones that required higher-order thinking.
Measuring Use and Creation of Open	McKerlich, Ives, & McGreal	Pilot of a survey about OER use, creation, and attitudes towards OERs at Athabasca	No	The authors found that OER creation increases emotional engagement (attachment, emotional ownership, motivation) more than OER use does.

Educational Resources in Tertiary education		University		"Forty-three percent of those in the sample are using OER and 31% are creating OER. This ratio of use to creation is introduced as a possible metric to measure adoption" (p. 90). The authors recommend that institutions adopt pro-OER policies. The authors felt that their research validated the OER Readiness Survey for monitoring and evaluation of OER engagement.
Open educational practices in tertiary education: institutional adoption and challenges	Murphy, 2013	Survey about OER adoption and OEP implementation in members of OERTen (foundational members of the OERu) and institutions not part of this group.	No	Motivations for joining the OERu were the ability to innovate and experiment in a low-risk environment. Major barriers to OER engagement were a lack of dedicated resources and staff for this purpose.
Beyond OER: Shifting focus to open educational practices. OPAL Report 2011.	OPAL, 2011	Extensive survey Respondents include policy makers, administrators, faculty members, and students Purpose: investigate OER adoption and OEP implementation	No	The main barriers to OEP implementation are: 1) Lack of institutional support; 2) Lack of technological tools; 3) Lack of skills and time of users; 4) Lack of quality or fitness of OER; 5) Personal issues (lack of trust and time). The authors recommend that OEP be adopted at the institutional level and in partnership with other institutions. They also believe that a culture of innovation would support OEP implementation and that OEP in turn stimulate new ways of learning.
Open educational resources: Staff attitudes and	Rolfe, 2012	6 preliminary interviews, 50 survey responses from staff in a UK university to explore staff awareness and	no	The university has a positive collegiate culture. Only nine participants (18%) were aware of OER.

awareness		attitudes towards OER		The term OER was fairly easy to grasp, which helps in OER awareness and adoption. There are two major programs support OER engagement in the UK: Tertiary education Funding Council for England (HEFCE) OER Programme presently run by the Tertiary education Academy (HEA) and the Joint Information Systems Committee (JISC), (JISC 2010). There was already a culture of sharing and borrowing of resources at the university, but not beyond the institution.
Striving toward openness: But what do we really mean?	Rolfe, 2017	8 interviews at De Montfort University in the UK involved in the HEFCE Open Educational Resource (OER) Programme (2009 – 2012; Jisc, 2015)	no	"The results of this study are that in this university, openness is represented by five elements – staff pedagogy and practice, benefits to learners, accessibility and access to content, institutional structures, and values and culture. This work shows the importance of adopting critical approaches to gain a deeper understanding of the philosophical and pedagogic stances within institutions" p. OEP allowed for more options for designing courses. The research stimulated questions about technical and legal issues when venturing beyond the institution in a learning context. Openness has benefits for access, inclusion, developing digital literacy skills, and learning innovation. Awareness of these benefits can inform OER advocacy.
Collaborative design and use of open educational resources: a case	Sapire & Reed 2011	Case study about collaborative design of math courses for student teachers using OER. Participants consisted of 15 math teacher educators	Seven principles for cultivating of communities of Practice Wenger et al., 2002,	As a result of the research, the authors promote collaborative course design for a context that suits multiple institutions, but not so general as to have no context. The authors recommend inter-institutional partnerships that are facilitated to maintain all participants' interest

study of a mathematics teacher education project in South Africa		from 9 universities	Five dimensions for evaluating OER initiatives: scope, authorship, licensing, granularity, teaching duration Joyce (2006) Constructivism was used in the course design	and motivation. The authors also recommend obtaining institutional support for such projects.
An Investigation into Social Learning Activities by Practitioners in Open Educational Practices	Schreurs et al. 2014	Interview of 3 people at each of 6 OEP initiatives to examine how people work and learn together within each initiative.	Framework for describing social configurations: Dimensions of social learning in teacher groups (Vrieling, Van den Beemt, & De Laat, 2016). The dimensions are: domain, practice, collective identity, and organization. A framework for observing and supporting community activity using these dimensions: participation, cohesion, identity, and creative capability Galley, R., Conole, G., & Alevizou, P. (2012).	Within a given initiative, there can be more than one social configuration (team, community of practice, open networks of practice, etc.) The authors suggest that open networks of practice are beneficial for learning. Their informal and self-directed nature and absence of a hierarchy are helpful. The authors recommend having a coordinator to foster knowledge sharing and adaptation to changing circumstances. They also recommend creating safe environment for participation.
A Case Study of Scholars' Open and Sharing Practices	Veletsianos, 2015	Ethnographic case study with the examination of online documents and communications of 30 randomly selected faculty members to see if they were openly licensed or not Research question: Do academics at an institution with no		The majority of the faculty members examined in this research do not share openly licensed academic artefacts. The researcher suggested that personal motivation is essential for OEPs in the absence of institutional policies that promote openness. The researcher calls for studies on why faculty engage or not with OEP, and whether a lack of awareness and understanding of CC licenses is the reason that faculty share materials but do not openly license them.

		discernible policies supporting openness share scholarly materials online in an open format?		

Appendix 2: Cameron & Quinn's four categories of organizational culture

Culture	Values, as per the opposing values framework	Key words and phrases to describe the culture	Leadership and other characteristics to describe the culture
Clan	**Internal focus and integration** Internal orientation Integration Unity Harmonious internal characteristics Ex. IBM & HP **Flexibility and discretion** Organizational versatility and pliability Flexibility Discretion Dynamism Changing, adaptable Organic Ex. Microsoft, Nike	Values: Cohesion, participativeness, individuality, sense of collectivity Characteristics: teamwork, employee involvement programs, corporate commitment to employees, Evidence: semi-autonomous work teams that receive awards based on team accomplishments, seeking feedback and ideas from staff Assumptions: teamwork and employee development are the best means for managing the environment, must develop a humane work environment, must empower employees and facilitate their participation, commitment and loyalty. Leaders are seen as mentors. "When rapidly changing turbulent environments make it difficult for managers to plan far in advance and when decision-making is uncertain, it was found that an effective way to coordinate organizational activity is to make certain that all employees share the same beliefs, values, and goals Loyalty, tradition, commitment are high. The organization emphasises the long-term benefit of individual development, with high cohesions and morale being important. Premium: teamwork, participation, consensus.	Leader: facilitator, mentor, parent Effectiveness criteria: cohesion, morale, development of HR Management theory: participation fosters commitment Good managers have these skills: Warm and supportive, parent figures, mentors, team builders, supporters, facilitators, nurturers. Ex. Disney Empowerment, team building, employee involvement, human resource development, open communication, "firms cannot treat customers any better than they treat their employees"

Adhocracy	**External focus and differentiation** Organizational separation and independence External orientation Rivalry Interact or compete with others outside their boundaries Ex. Toyota and Honda (Think globally, act locally) **Flexibility and discretion** Organizational versatility and pliability Flexibility Discretion Dynamism Changing, adaptable Organic Ex. Microsoft, Nike	Most responsive to the hyperturbulent hyper-accelerating conditions that typify the organizational world of the 21st century Assumptions: Innovative and pioneering initiatives lead to success. Organizations are mainly in the business of developing new products and services and preparing for the future Major task: to foster entrepreneurship, creativity, and activity on the cutting edge Emphasis: Creating a vision of the future, organized anarchy and disciplined imagination. Ad hoc Temporary, specialised, dynamic unit. Committees dissolve when their objective is reached. Can reconfigure rapidly based on new circumstances Goal: foster adaptability, flexibility, creativity where uncertainty, ambiguity and information overload are typical Examples: in aerospace, software development, think-tank, consulting, Produce innovative products and services, and adapt quickly. Power flows from individual to individual or team to team. High emphasis on individuality, risk-taking, anticipating the future	Leader: Innovator, visionary, entrepreneur Effectiveness criteria: cutting-edge output, creativity, growth Management theory: Innovativeness fosters growth Good managers have these skills: Rule breakers, entrepreneurial, visionary, risk-oriented, innovative, focused on the future, creative New products, creative solutions to problems, cutting edge ideas, growth in new markets Innovation and new ideas create new markets, new customers and new opportunities Surprising and delighting customers, creating new standards of performance, anticipating customer needs, engaging in continuous improvement, implementing creative solutions to problems that produce new customer preferences
Hierarchy	**Internal focus and integration** Internal orientation Integration Unity Harmonious internal characteristics Ex. IBM & HP **Stability and control** Steadiness and durability Stability Order Control Stable Predictable Mechanistic Ex. Boeing	Rules, specialisation, meritocracy, hierarchy, separate ownership, impersonality, accountability Formalised and structured place to work Procedures govern what people do Effective leaders are good coordinators and organizers Maintaining a smooth-running org is important Long-term concerns: stability, predictability, efficiency Formal rules and policies hold the organization together Internal control is maintained by rules, specialised jobs, centralised decisions	Leader: coordinator, monitor, organizer Effectiveness criteria: efficiency, timeliness, smooth functioning Management theory: control fosters efficiency Good managers have these skills: Rule-enforcers, organizing, controlling, monitoring, administering, coordinating, maintaining efficiency Cohesion, high employee morale and satisfaction, HR development, teamwork Involvement and participation of employees fosters empowerment and commitment Committed, satisfied employees produce effectiveness Ex.: IRS needs error-free efficiency Improving measurement, process control, systematic problem solving, tools: pareto charting, fishbone diagramming, affinity charts, variance plots.

Market	**External focus and differentiation** Organizational separation and independence External orientation Rivalry Interact or compete with others outside their boundaries Ex. Toyota and Honda (Think globally, act locally) **Stability and control** Steadiness and durability Stability Order Control Stable Predictable Mechanistic Ex. Boeing	Organizes that functions as a market Focused on: transactions with external suppliers, customers, contractors, licensees, unions, regulators Operates mainly through economic market mechanisms Focus: to conduct transactions: contracts, exchanges, sales Objectives: profitability, bottom line results, strength in market niches, stretch targets, secure customer bases Core values: competitiveness, productivity Basic assumptions: external environment is hostile, consumers are choosy (want value), aim is to increase its competitive position, Seek productivity, results, profits. Need a clear purpose and aggressive strategy. Results-oriented	Leader: hard-driven, competitor, producer Effectiveness criteria: market share, goal achievement, beating competitors Management theory: competition fosters productivity Good managers have these skills: tough and demanding, hard-driving, whip-cracking, backside-kicking, directing, producing results, negotiating, motivating others Achieving goals, outpacing the competition, increasing market share, acquiring premium levels of financial return Effectiveness: Competition up and productivity up Ex. GM + Ford + Chrysler vs. Toyota, Nissan, Honda Measuring customer preferences before and after product and service delivery, improving productivity, creating partnerships with supplies and customers, enhancing competitiveness by involving customers in planning and designing.

Appendix 3. Questions for administrators of OERu

The main questions are numbered. Indented questions below the main questions are intended as follow-up questions.

1. Here is the definition of OER that I am using in my research: OERs are instructional materials such as books, journal articles, courses in print and digital forms that are openly licensed and thus available for retention, reuse, revision, remixing, and redistribution. Would you change this definition in any way?

2. What is the process for creating OER for the OERu?
   Please describe or expand on the selection or design of student tasks and types of assessments.
   Please specify the tools you use.
   How does the design and development group work together to produce a course? (online, offline, simultaneously, in a linear or sequential process)

3. What kind of resources and training do you think are required to facilitate the development of OERs by academic staff?

4. Here is a definition of Open Educational Practises: Open Educational Practices are tools, policies, instructional and technological training, quality assurance frameworks and other actions, resources and infrastructure which facilitate the use of OERs. Is this what OEP are to you? If not, how would you change this definition?

5. What kind of OEP support requests are made of the OERu by the partners? For example, on the development of skills (pedagogical, technological, legal – CC licenses)

6. What kind of stakeholder consultations are made in the process of planning and implementing OEPs?
   Do you contact academics, tech support staff, elearning support staff, students, librarians, or other staff members? How do you contact them?

   How would you describe the culture at the OERu? What impact do you think the culture has on supporting OEP implementation in the Partner Institutions?

7. What approaches are useful for establishing a culture of sharing within a university? Across the OERu network?
   What specific measures have you taken to foster an open (sharing) culture?

8. An obstacle to the spread of open educational resources in tertiary education is the unwillingness of academics to use resources produced by others. How do you feel about using course materials produced by someone else?
   What can be done to foster the use of OERs?

9. What kind of management approaches are effective for getting university staff to act on OEP implementation?

   How open are the Partner Institutions to the idea of allocating professional development time to their staff so that they can effectively carry out tasks related to open education?

   How do they feel about providing incentives or official recognition (contributing to promotions)?

10. What would the OERu find useful from this research?

11. Who else would you recommend that I speak to?

12. And are there any documents or other material that you recommend I review?

Appendix 4. Questions for course developers for the OERu

The main questions are numbered. Indented questions below the main questions are intended as follow-up questions.

1. Here is the definition of OER that I am using in my research: OERs are instructional materials such as books, journal articles, courses in print and digital forms that are openly licensed and thus available for retention, reuse, revision, remixing, and redistribution. Would you change this definition in any way?

2. What is the process for creating OER for the OERu?
   Please describe or expand on the selection or design of student tasks and types of assessments.
   Please specify the tools you use.
   How does the design and development group work together to produce a course? (online, offline, simultaneously, in a linear or sequential process)

3. Here is a definition of Open Educational Practises: Open Educational Practices are tools, policies, instructional and technological training, quality assurance frameworks and other actions, resources and infrastructure which facilitate the use of OERs. Is this what OEP are to you? If not, how would you change this definition?

4. How are you involved in open educational practices, particularly with regards to instructional design of courses built for the OERu?
   Please describe or expand on the open design process and the use of open teaching and learning approaches.

5. What learning theories or instructional design theories do you apply when designing courses for the OERu? How do you apply the theory(ies)?

6. When you design and develop courses, do you work with a group that acts like a Community of Practice?
   To what extent does the group focus on sharing or broadening/deepening knowledge and skills of OEP?

7. What approaches are useful for establishing a culture of sharing within a university? Across the OERu network?
   What specific measures have you taken to foster an open (sharing) culture?

8. An obstacle to the spread of open educational resources in tertiary education is the unwillingness of academics to use resources produced by others. How do you feel about using course materials produced by someone else?
   What can be done to foster the use of OERs?

9. What would the OERu find useful from this research?

10. Who else would you recommend that I speak to?

11. Are there any documents or other material that you recommend I review?

Appendix 5. Questions regarding the organizational culture of OERu

The questions below are those that I intend to ask during our interview. This interview follows up on the answers you provided in the **Organizational Culture Assessment Instrument.** Given that it is a semi-structured interview, there is flexibility in the formulation and ordering of the questions. Some questions may be replaced by others that are posed spontaneously during the interview based on your answers. When it is necessary, I will add follow-up questions for clarity or to obtain specific information, for example.

Please take note of the definition of culture below and consider it as you read through the questions in this section in advance of the interview.

Schein and Schein (2016) define culture in this way:

> "The culture of a group can be defined as the accumulated shared learning of that group as it solves its problems of [adapting to external conditions and integration of internal processes] which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, feel, and behave in relation to those problems. This accumulated learning is a pattern or system of beliefs, values, and behavioral norms that come to be taken for granted as basic assumptions and eventually drop out of awareness" (p. 6).

1. Does the OERu have a culture of openness? How does it express this openness?

2. How does the OERu demonstrate openness, besides using open platforms, infrastructure, and technology? In other words, in its communication and behavior, how does the OERu make efforts to welcome new people or new ideas, in its forums, online meetings, and face-to-face meetings?

3. How does the OERu express openness towards **students** of different cultures during the course design process? How does it express openness towards **new OER members** of different cultures during the course design process?

4. Describe the culture of the OERu during social activities. Is everyone invited to all formal and informal events? Do the interactions at these events shape how the OERu runs?

5. Do you believe that the OERu's organizational culture is still developing or is it established? What evidence can you provide to support your answer?

6. Which organizational values do you regard as preferable for the OERu? How does the OERu apply these values in its regular practices? How would you like to see the OERu acting on these values?

7. Which organizational values do you regard as preferable for the OERu with regards to course design and development? How does the OERu apply these values in its regular practices? How would you like to see the OERu acting on these values?

Appendix 6: Sequence of communications to plan the OERu International Partners meeting of 2016

Event	Date, Location, Communication format	Video-recorded Meeting #	Message content or event	Attendance / Response
1	25 Aug 2016 Online Blog post		OERu focal points (OERu, 2016af)	No response in the forum
2			OERu Management Committee (OERu, 2016ae) (OERu, 2016ae)	No response in the forum
3			Marketing, Communications & Partner Engagement Working Group (OERu, 2016ad) (OERu, 2016ad)	No response in the forum
4	7 Sept 2016 Online Web conference	1	Online meeting to plan the agenda for the International Partners' meeting (OERu, 2016k; 2016w) (OERu, 2016af) (OERu, 2016af)	Attendance: Anonymous persons 1, 2, 3, 4, 5, 6, 7, and 8 Message from the OERu CEO inviting edits to the agenda No response in the Talk page of the draft agenda (OERu, 2016r) Editors, based on the History tab: The OERu CEO (majority of edits), Anonymous persons 2, 6, 7, and 9. Some contributions were likely made to the OERu CEO in an email. the OERu CEO would have then added the ideas to the page. Example: Anonymous person 10
5	Various dates close to 3 & 4 October 2016 Online Planning document	2	5th meeting of the OERu partners Formally published meeting agenda (OERu, 2016s) Minutes (OERu, 2016p)	Agenda Talk page: No comments History: sole editor: the OERu CEO Minutes: History: the OERu CEO (majority) and Anonymous person 9 Talk page: Comments from two people about use of a name and use of terms, encouraging consistency "Decision recommendations" and "Decision proposals". "Decision recommendations" was selected.
5.1	3 & 4 Oct 2016 University of the Highlands and Islands, Inverness, Scotland Face-to-face meeting at	3	Critical Friend Review – Recorded meeting (OERu, 2016l) Agenda, Session 2 of Day 1 (OERu, 2016ah) Report (OERu, 2016p)	26 people 11 universities 7 countries 2 non-degree-granting organizations (OERu, 2016y)
5.2	3 & 4 Oct 2016 University of the Highlands and Islands, Inverness, Scotland Face-to-face meeting at	4	Improving Operations – Recorded meeting (OERu, 2016k) Agenda, Session 3 of Day 1 (OERu, 2016f) Report (OERu, 2016p)	
6	Evening of 4 Oct 2016, between Partners' meeting and Council of the CEOs meeting Online		Rough draft of the agenda (OERu, 2016z) Final version of the agenda (OERu, 2016x)	Talk page: no content History: all but one change was made by the OERu CEO. The other was made by Anonymous person 9

	Document in WikiEducator			
7	5 Oct 2016 University of the Highlands and Islands, Inverness, United Kingdom Face-to-face meeting at		4th meeting of the OERu Council of CEOs. Agenda (OERu, 2016x) Report (OERu, 2016o)	Agenda: No activity in the Discussion page History, editors: mostly changes by the OERu CEO, some changes by Anonymous person 9 Report: No activity in the Discussion page History, editors: mostly changes by the OERu CEO, many changes by Anonymous person 9, three changes by Anonymous person 7 16 people 11 universities 7 countries 2 non-degree-granting organizations (OERu, 2016y)
8	15 Nov 2016 Online meeting	5a 5b	OERu 16-11 Oceania meeting agenda consultation (Part A) Video of the online meeting (OERu, 2016m) OERu 16-11 Oceania meeting agenda consultation (Part B) (OERu, 2016n) Agenda and report (OERu, 2016w) (OERu, 2016w)	**Attendance**: Anonymous person 11, 12, 13, 14, John, and the OERu CEO No comments in the Talk page. History edits: the OERu CEO made the majority of the changes. Anonymous person 9 made three.
9	24 Nov 2016 Charles Sturt University, Homebush Campus		Agenda (OERu, 2016u)	No activity in the Talk page History edits: the OERu CEO made the majority of the changes. Anonymous person 9 made three changes, Anonymous person 15 made one change 15 people 7 universities 1 non-degree-granting organizations 3 countries (OERu, 2016u)
	12 & 13 Oct 2017 eCampus Ontario, Toronto, Canada Online planning documents		OERu partner's meeting 2017 Agenda (OERu, 2017f) Report (OERu, 2017e)	39 people 18 universities 4 non-degree-granting organizations 7 countries (OERu, 2017i)
	12 & 13 October 2017 eCampus Ontario, Toronto, Canada Face-to-face meeting		OERu 17-10 - Feedback Session 3 Improving OERu operations (OERu, 2017b)	
	12 & 13 October 2017 eCampus Ontario, Toronto, Canada Face-to-face meeting		OERu 17-10 - Session 4 Ontario open education showcase (OERu, 2017c).	
	16 Oct 2017		OERu Council of CEOs	18 people

	Contact North | Contact Nord, Toronto, Canada Face-to-face meeting		meeting Agenda (OERu, 2017h) Report (OERu, 2017g)	10 universities 2 non-degree-granting organizations 5 countries (OERu, 2017i)
	7 & 8 Nov 2018 Charles Sturt University Port Macquarie, Australia Face-to-face meeting		OERu partner's meeting 2018 Agenda (OERu, 2018o) Report (OERu, 2018f)	32 people 14 universities 2 non-degree-granting organizations 6 countries Online participants 50 people 23 universities 7 non-degree-granting organizations 14 countries (OERu, 2018n)
	9 Nov 2018 Charles Sturt University Port Macquarie, Australia Face-to-face meeting		OERu Council of CEOs meeting Agenda (OERu, 2018m) Report (OERu, 2018g)	19 people 10 universities 2 non-degree-granting organizations 6 countries (OERu, 2018n)

Appendix 7. Posts in the LiDA discussion forum and the frequency of replies

Type of post	Date	Number of replying contributors	Number of replies	Comment
Announcement	22 Apr 2016	0	0	
Announcement	29 Apr 2016	0	0	The post was about crowdsourcing. Replies were made elsewhere, in more suitable locations.
Post explaining the process of designing the curriculum of LiDA and requesting feedback.	14 May 2016	2	3	
Request for feedback ad request for a specific person to make additions	17 May 2016	0	0	The person who was requested to add content did so.
Announcement	17 May 2016	1	1	The post announced a now-expired doodle poll. The answers would have been provided there.
Announcement	22 May 2016	0	0	
Announcement	13 May 2016	2	2	One reply was substantive, offering course content and time for development.
Announcement	4 Jun 2016	0	0	
Announcement	22 Jul 2016	0	0	
Announcement	26 Jul 2016	0	0	
Announcement and request for feedback on course development	18 Jun 2017	2	5	The replies consisted of questions and thank-you messages.
Announcement and request for feedback on course development	11 Jul 2017	2	3	Sharing of a substantial draft document on assessment with a CC-BY license based on the course content
Announcement and request for feedback on course development	24 Jul 2017	0	0	Some changes were made to the wiki pages of the course content in question.
Contribution from someone who frequently replies	30 Jul 2017	1	1	Sharing of the final version of the assessment document.
Announcement about completing a micro-course	30 Jul 2017	1	1	
Announcement about completing a micro-course	6 Aug 2017	0	0	Changes are made by a partner to a document presented in the announcement.
Announcement about completing a micro-course	20 Aug 2017	1	1	Substantial feedback was provided.

Appendix 8. Findings about stressors: My contribution to the literature

This appendix organizes all of the stressors found in this research according to whether they are new (Tables A8.1 and A8.2), whether they confirm findings in the literature (Table A8.3) or extend them (Table A8.4)

Table A8.1. New stressors related to OER and OEP

OER adoption pyramid category	Stressor
Category 2: Permission	Stressor 7.2. Barrier: Retention of software license by the institution
Category 4: Capacity	Stressor 6.14.* Enabler: Use of open source technology Stressor 6.18.* Enabler: Availability of open source technology Stressor 7.5.* Barrier: Building capacity of delivering innovative courses Stressor 7.6. Barrier: Structural barriers Stressor 7.7. Barrier: Major disruptions to the system
Category 6: Volition	Stressor 7.20. Enabler: Little involvement by the federal government

Table A8.2 New stressors related to the OERu

OER adoption pyramid category	Stressor
Category 3: Awareness	Stressor 6.6.* Barrier: Misconceptions inhibiting participation in the OERu and engagement with OEP Stressor 6.7.* Enabler: Navigation and consultation of OERu's open documents
Category 4: Capacity	Stressor 6.12.* Enabler: Openness of OERu planning documents and communication channel Stressor 6.15.* Enabler: AVI (concept) Stressor 6.16.* Barrier: Target learners' capacity to study in the OERu's courses without tutorial support
Category 6: Volition	Stressor 6.21.* Enabler: Slow pace of innovation Stressor 7.17.* Enabler: Consequence of producing courses as an OERu partner Stressor 7.18.* Enabler: Alignment of mission with OERu and OERu's other Partner Institutions

Table A8.3. Stressors that confirm previous findings

OER adoption pyramid category	Stressor	Literature sources
Category 1: Access	Stressor 6.1* Enabler: Provision of access to OERu infrastructure	Cox & Trotter 2016, 2017a, 2017b De Hart et al., 2015
Category 2: Permission	Stressor 6.2. Enabler: Permission granted or not by a PI to a course	Cox & Trotter, 2017a

	developer to openly license a course Stressor 6.3.* Enabler: Permission granted by OERu to a course developer to openly license a course Stressor 7.1. Barrier: Retention of intellectual property rights by the institution	
Category 3: Awareness	Stressor 6.4. Barrier: A lack of awareness and understanding of OER Stressor 7.4. Enabler: Increasing awareness about OER and OEP	Baas et al., 2019 Cox & Trotter, 2017a McKerlich et al., 2013 Rolfe, 2012
	Stressor 6.8. Barrier: Lack of access to OER due to organizational issues	Baas et al., 2019
	Stressor 7.3. Barrier: Poor perceptions of OER	Al Abri and Dabbagh, 2018 Murphy, 2013 Wiley et al., 2014
	Stressor 6.9. Enabler: Students' awareness of OER.	Sandanayake, 2019 Woodward, 2017
Category 4: Capacity	Stressor 6.10. Enabler: Spread of professional knowledge and skills Stressor 7.8. Enabler: Staff knowledge and skills	Baas et al., 2019 Cox & Trotter, 2017a De Hart et al., 2015 Karunanayaka et al., 2015 McKerlich et al., 2013 Murphy, 2013 Rolfe, 2012 Schreurs et al., 2014 Wiley et al., 2014 Rodés, 2019
	Stressor 6.11. Barrier: Lack of energy (time, funds, resources)	McKerlich et al., 2013 Murphy, 2013 Rodés, 2019 Rolfe, 2012
	Stressor 7.9. Enabler: Active participation of individuals in open education activities while holding leadership positions	Otto, 2019
	Stressor 7.10. Enabler: Professional development offered through regional or national networks Stressor 7.11. Enabler: Personal contacts in professional networks	Schreurs et al., 2014
Category 5: Availability	Stressor 7.12. Barrier: Rarity of OER with a particular license or format	Cox & Trotter, 2017a
	Stressor 7.13. Barrier: Rarity of OER on advanced or narrow topics	Cox & Trotter, 2017a Rodés, 2019
Category 6: Volition	Stressor 6.20. Enabler: Financial incentives Stressor 6.22. Enabler: Motivation through encouragement Stressor 7.16.* Enabler: Internal funding dedicated to OEP	Belikov & Bodily, 2016 Rodés, Gewerc-Barujel, & Llamas-Nistal, 2019
	Stressor 6.23. Enabler: Distribution of work among partners	OPAL, 2011 Schreurs, 2014
	Stressor 6.24. Enabler: Practice of seeking out champions	Schreurs et al., 2014
	Stressor 6.25. Barrier: The OERu's perceived need for a change of	Rodés, 2019

	culture regarding OERs	Rolfe, 2012 Sandanayake, 2019
	Stressor 6.27. Enabler: Learning theories for open learning	Jhangiani 2015; 2017
	Stressor 6.28. Enabler: Volition of students to engage Stressor 7.19. Enabler: Students' advocacy for open textbooks	Sandanayake, 2019 Woodward, 2017
	Stressor 7.15. Enabler: Personal initiative	McKerlich et al, 2013 Rodés, 2019

Table A8.4. Stressors that extend findings in the literature

OER adoption pyramid category	Stressor	Literature sources	Description of the extension
Category 3: Awareness	Stressor 6.5. Enabler: Learning about the benefits of Free Cultural Works.	De Hart et al., 2015 Cox & Trotter, 2017a Karunanayaka et al., 2015 McKerlich et al., 2013 Murphy, 2013 Rolfe, 2012 Wiley et al., 2014 Rodés, 2019	The literature sources reported on professional development regarding open licensing. My findings specify the types of licensing associated with Free Cultural Works.
Category 4: Capacity	Stressor 6.13. Enabler: Open courses developed by the OERu on the topic of the design of OERs	Cox & Trotter, 2017a De Hart et al., 2015 Karunanayaka et al., 2015 McKerlich et al., 2013 Murphy, 2013 Rolfe, 2012 Schreurs et al., 2014 Wiley et al., 2014	There are various ways of providing professional development that the cited sources have mentioned. My findings included several courses developed specifically by the OERu.
	Stressor 6.17. Enabler: Building learners' capacity through LiDA	Sandanayake, 2019 Davis & Mackintosh, 2013	The literature has reported on courses built with OER that developed the learners' capacity to learn in an online environment. The findings in the current research report on a new course, LiDA. LiDA was designed specifically for learning about ICT, open licensing, and open environments among other topics.
Category 5: Availability	Stressor 7.14. Barrier: Lack of comprehensive OER courses	Cox & Trotter, 2017a	This point extends literature findings about the availability of OER by specifying that some faculty members prefer to engage with OER only if they are comprehensive resources.
Category 6: Volition	Stressor 6.19. Barrier: Administrative issues	Belikov & Bodily, 2016 McKerlich et al., 2013 Murphy, 2013 Rodés, 2019 Rolfe, 2012	The literature sources discuss changing institutional strategies and policies to support OER engagement. The findings from my research extend the findings in the literature by illustrating a way in which one can work within an institution's existing policies to produce OER, particularly when stimulated by an inter-institutional partnership.
	Stressor 6.26. Barrier: Challenges of working in an open online	Cox & Trotter, 2017a Rodés, 2019	The findings mentioned in the literature were about the sense of vulnerability encountered while sharing OER. The findings in my research were about the sense of vulnerability encountered during the process of open design

	environment		

Appendix 9. OERu's stressors

Category of stressor	Course ecosystem			Organizational ecosystem			Regional or National ecozone			Global ecosphere		
	Student	Course developer or facilitator	Administrator	Student	Course developer or facilitator	Administrator	Student	Course developer or facilitator	Administrator	Student	Course developer or facilitator	Administrator
Access	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure	6.1. Provision of access to OERu infrastructure
Permission						6.2. Enabler: Permission to openly license a course (by OERu)						
												6.3. Enabler: Permission to openly license a course (by a PI)
Awareness		6.4. Barrier: A lack of awareness and understanding of OER			6.4. Barrier: A lack of awareness and understanding of OER			6.4. Barrier: A lack of awareness and understanding of OER			6.4. Barrier: A lack of awareness and understanding of OER	
											6.5. Enabler: Learning about the benefits of Free Cultural Works	
												6.6. Barrier: Misconceptions - funding - language
												6.7. Enabler: Navigation and consultation of OERu's open documents
												6.8. Barrier: Lack of access to OER
	6.9. Enabler: Students' awareness of OER						6.9. Enabler: Students' awareness of OER			6.9. Enabler: Students' awareness of OER		
Capacity		6.10. Enabler: Spread of professional knowledge and skills			6.10. Enabler: Spread of professional knowledge and skills			6.10. Enabler: Spread of professional knowledge and skills			6.10. Enabler: Spread of professional knowledge and skills	
		6.11. Barrier: Lack of energy (time, funds, resources)										

											6.12. Enabler: Openness of OERu planning documents and communication channels	
											6.13. Enabler: Open courses on design of open courses	
											6.14. Enabler: Use of open source technology	6.14. Enabler: Use of open source technology
											6.15. Enabler: AVI (concept)	6.15. Enabler: AVI (concept)
	6.16. Barrier: Target learners' capacity to study						6.16. Barrier: Target learners' capacity to study			6.16. Barrier: Target learners' capacity to study		
	6.17. Enabler: Building learners' capacity through LiDA						6.17. Enabler: Building learners' capacity through LiDA			6.17. Enabler: Building learners' capacity through LiDA		
Availability												6.18. Enabler: Availability of open source technology
												6.19. Barrier: Administrative issues
												6.20. Enabler: Financial incentives
												6.21.* Enabler: Slow pace of innovation
											6.22. Enabler: Motivation through encouragement	
											6.23. Enabler: Distribution of work among partners	
											6.24. Enabler: Practice of seeking out champions	
											6.25. Barrier: The OERu's perceived need for a change of culture	6.25. Barrier: The OERu's perceived need for a change of culture
											6.26. Barrier: Challenges of working in an open online environment	
Volition											6.27. Enabler: Learning theories for open learning	

	6.28. Enabler: Volition of students to engage						6.28. Enabler: Volition of students to engage			6.28. Enabler: Volition of students to engage		

Category of stressor	Course ecosystem			Organizational ecosystem			Regional or National ecozone			Global ecosphere		
	Student	Course developer or facilitator	Administrator	Student	Course developer or facilitator	Administrator	Student	Course developer or facilitator	Administrator	Student	Course developer or facilitator	Administrator
Access												
Permission						7.1 Retention of IPR						
						7.2 Retention of software license by the institution						
Awareness		7.3. Barrier: Poor perceptions of OER	7.3. Barrier: Poor perceptions of OER		7.3. Barrier: Poor perceptions of OER	7.3. Barrier: Poor perceptions of OER		7.3. Barrier: Poor perceptions of OER	7.3. Barrier: Poor perceptions of OER		7.3. Barrier: Poor perceptions of OER	7.3. Barrier: Poor perceptions of OER
	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP	7.4. Enabler: Increasing awareness about OER and OEP
Capacity		7.5.* Barrier: Building capacity of delivering innovative courses										
						7.6.* Barrier: Structural barriers - course design processes - silo effect						
						7.7. Barrier: Major disruptions to the system						
		7.8. Enabler: Staff knowledge and skills	7.8. Enabler: Staff knowledge and skills			7.8. Enabler: Staff knowledge and skills						
						7.9. Enabler: Active participation as a keystone species						
								7.10.* Enabler: Professional development				
											7.11.* Enabler: Personal contacts in professional networks	

Availability											7.12. Barrier: Rarity of OER with a particular license or format	7.12. Barrier: Rarity of OER with a particular license or format	
											7.13. Barrier: Rarity of OER on advanced or narrow topics	7.13. Barrier: Rarity of OER on advanced or narrow topics	
											7.14. Barrier: Lack of comprehensive OER courses	7.14. Barrier: Lack of comprehensive OER courses	
Volition		7.15. Enabler: Personal initiative											
			7.16. Enabler: Internal funding dedicated to OEP			7.16. Enabler: Internal funding dedicated to OEP							
						7.17.* Enabler: Consequence of producing courses as an OERu partner							
													7.18. Enabler: Alignment of mission with OERu and OERu's other Partner Institutions
				7.19. Enabler: Students' advocacy for open textbooks			7.19. Enabler: Students' advocacy for open textbooks						
									7.20. Enabler: Little involvement by the federal government				