

Pitching to the ‘Big Fish’: Elevating Presentation and Communication Skills in a Software Quality Course

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Abstract. In this work, we present a Software Quality teaching experience based on gamification. In this experience, “A Meeting with the Big Fish”, the lecturer and students play different roles in a Shark Tank-like situation. The lecturer (Big Fish) and their sharks maintain a planned meeting with students where harsh and unexpected situations happen to students while presenting a Software Process Improvement proposal. Initial results have shown the effectiveness of the activity in terms of engagement, fun, and authenticity.

Keywords: Gamification in Education · Game-based learning · Pitching · Software Process Improvement · Communication skills

1 Introduction

Gamification proposes to use game thinking and dynamics to increase engagement and stimulate users’ active participation, thus enhancing the outcomes [8]. Introducing gamification in educational contexts may benefit student attentiveness and understanding of the course material, lower tension, and boost student morale [10]. As a result, using playful elements in learning environments promotes a powerful learning experience through which to develop knowledge, skills, and/or abilities [8].

In the case of Software Engineering (SE) education, gamification is useful for modeling specific behaviors and for motivating students to apply SE practices and concepts to their development endeavors [9]. However, despite the potential of gamification in SE education in terms of motivating students, few studies offer sound empirical evidence about the impact of gamified applications on user engagement and performance [7].

This innovative and exploratory paper presents as its most important contribution “*A Meeting with the Big Fish*”, a gamified activity that aims to improve students’ learning experience in a Software Quality course. The ‘Big Fish’ gamified activity integrates pitching and game elements to present a **Software Process Improvement (SPI)** assignment, so students can practice and enhance their confidence, communication, and presentation skills.

The remainder of this paper is structured as follows. Section 2 describes the relevant concepts on which the activity is based and the course in which it is developed. Section 3 describes the Big Fish activity, while Section 4 presents the discussion. Finally, Section 5 presents conclusions and future work.

2 Background and Related Work

2.1 Pitching and Shark Tank

Pitching refers to presenting a product or service to a potential investor to convince them of its viability and value so they fund it. The “pitch” should be concise, and engaging, must highlight the key features of the product/service, and show that it will deliver value. Pitching is usually a targeted, pre-prepared sounding speech addressed to potential investors and accompanied by visual elements (slides, demonstration of promoted objects in action, etc.) [2].

An effective pitch requires clear communication, effective storytelling, showcasing market opportunity, addressing potential risks, and emphasizing the value and uniqueness of the proposal. While pitching encloses soft skills that SE students would benefit to have, communication has not yet received proper coverage in scientific discourse [2].

The “Shark Tank” is a reality television show where participants pitch an idea for entrepreneurial funding [1]. Entrepreneurs pitch their products or services to negotiate investment deals and seek this financial support from the “sharks” (panel of investors), who assess the viability and potential of the product/service.

Following the idea of Shark Tank and pitching, a gamified activity was created in a Software Quality fourth-year course to help students develop and/or improve communication, presentation, negotiation, and persuasion skills, which can benefit them personally and professionally.

Related work has been developed by Haertel et al. [4], where they used “Shark Tank” to improve creativity and entrepreneurship aspects in Engineering students. They found that students tended to avoid radical innovations and risks even in a playful atmosphere. Moore et al. [5] presented the InVenture Challenge, a Shark Tank-based activity that attempts to deliver an authentic experience to introduce students to Engineering. They concluded that it effectively engages students and entrepreneurship through invention.

2.2 The Course: SENG403 – Software Process and Product Quality

The SENG403 – Software Process and Product Quality course introduces fundamental concepts, methodologies, and techniques related to software quality throughout the entire software development lifecycle [3]. Taught at the University of Canterbury, SENG403 is an elective course offered to fourth-year Software Engineering, as well as Computer Science (Hons.) and Master students in Information Systems and Information Technology. The course content has been designed by one of the authors of this paper, drawing upon their experience in

the software industry as a business analyst, developer, tester, and project and product manager.

SENG403 pursues ten Learning Outcomes (LOs), being relevant for this paper the following ones:

- LO2 – Apply analysis skills to abstract and devise quality problems affecting process, product, and people (the P’s) in software engineering.
- LO3 – Hypothesize specific improvements to make the three P’s more effective, efficient, and reliable.
- LO8 – Plan and evaluate, in the form of an experience report, an organizational process or product in terms of quality attributes.
- LO9 – Write, compose, and explain Software Quality Assurance (SQA) outcomes (assessments, audit reports, plans), supported by an oral synthesis to demonstrate effective communication skills both in report writing and presentation.

Course content. The topics presented in this course include an introduction to the basic concepts of software quality, a review of the industry’s most commonly used quality standards and models, and a presentation of several SQA-related tools and techniques. The core topic, in the context of this paper, is *Quality in Software Processes*, where a comprehensive exploration of the obstacles encountered by organizations during software product development and the strategies employed to address them through SPI initiatives is presented. The full description of the course can be consulted at [3].

Assessment. The course assessment is split into three items: two assignments (30% each) and a final exam (40%). In Assignment I, students work in teams and create an SPI proposal from their own practical experience. This assignment allows students to reflect on current software engineering practice critically. Besides, it allows them to evaluate and adapt techniques, methodologies, and practices to their needs. This assessment item addresses LO2, LO3, LO8, and LO9. The Assignment I specification is released during week 5 of the course and should be handed out four weeks later. It is marked, and feedback to students is provided (week 11) so they have the opportunity to improve their SPI proposal. During the last week of the semester (week 12), teams should pitch their SPI proposal during the Big Fish activity.

For completeness, Assignment II is related to a software product assessment in which students are expected to measure specific quality attributes of a product using the ISO/IEC 25010 standard. This assignment is also developed in teams.

3 The game: A Meeting with the ‘Big Fish’

3.1 Activity in Context

A Meeting with the Big Fish is a gamified activity in which students are required to pitch an SPI proposal. The game elements integrated into it are challenges,

points, time constraints, and play money. The SPI proposal has been developed in teams of three or four students as part of one of their course assignments (see section 2.2). Each team will act as if they were a startup responding to a Request for Proposals (RFP) launched by a Big Fish organization.

During the pitch, which should last at most six minutes, students will try to convince the Big Fish to contract their services. Each team will role-play to be a startup and will present their proposal to the Big Fish and their team of advisors. The lecturer performs the Big Fish’s CEO, and the panel of advisors (sharks) is formed by three or four postgrad students that are familiar with the activity and were asked to act as sharp, brutal, and with little patience sharks. The sharks will play the roles of CTO, CFO, COO, and CMO (optional). In addition to this, several “unexpected” situations can occur at any time, and students are assessed on how they handle these.

The proposals are assessed in terms of *planning* (were the scope, time, and effort specified?), *completeness* (were the required elements defined?), *risks awareness*, *feasibility/appropriateness* (is the SPI doable given the organization’s constraints?), *objectivity*, *measurable improvement* (are the defined metrics quantifiable?), *clarity of presentation*, and an *extra aspect* chosen by the sharks (e.g., passion, engagement, innovation). It is important to mention that students know that the meeting will be ruthless but fair, and always under a teaching-innovative and controlled academic umbrella. Teams are assessed before, during, and after their presentations; everything they do or say counts. Each team starts the meeting with 10 “confidence votes” (points), represented by colored balls, and their goal is to keep as many of them as possible. They can lose votes throughout the meeting depending on how they manage the unexpected situations (see Figure 1).

3.2 Activity Set-up

The meeting should be held in a room specially arranged for the activity. To make the most of it, the room should not be familiar to students, so they are not aware of what would be available (e.g., a projector, a computer, WiFi access) or how the chairs and tables will be set up.

The week before the meeting, students have had received an email from the Big Fish’s personal assistant:

*“Dear <startup>,
I hope this email finds you well. I am writing to request a meeting with you to discuss your SPI proposal. The meeting will be held on <date> at <time>. Please be prepared and have everything ready because the CEO has only one hour available. We anticipate a fruitful discussion during our upcoming meeting.
Best regards,”*

At this point, students know that:

- The Big Fish is a very busy person. So, for sure, they won’t have a one-hour meeting (time constraints).

- The organization has ample financial resources.
- The organization has strict security policies that include access to physical and virtual resources.
- The meeting date and time, and that it will be at the headquarters of the organization.

Regarding the room, the arrangement of chairs and tables should promote a sense of authority, formality, and centrality for the Big Fish, who will lead the meeting. Chairs are placed along the sides of the table for participants, while the Big Fish sits at the head of the table, facing the other participants, giving a sense of authority and importance. The Big Fish will be surrounded by their sharks, which was not something expected by the students.

Name cards should be placed at each seating position to indicate where each student is supposed to sit during the meeting (personalization). Teams should have access to a projector but not WiFi.

3.3 Unexpected situations

The unexpected situations (challenges) randomly occur to teams before, during, and after the meeting; see Table 1. These are designed to assess students’ capability to be creative, tackle and solve problems. Each of these situations is based on real cases the authors of this paper experienced during software projects carried out in different industries.

Before the meeting, students will face three unexpected situations related to access to the building, WiFi, and connecting to the projector. During and after the meeting, students can be bombarded with difficult, malicious, or ill-intentioned questions by the sharks, like questions about the team’s capabilities or the “high” cost or complexity of their proposals. Depending on how the students handle these, the Big Fish (and the sharks) will decide how many votes they will lose; if handled well, students will keep their votes. The unexpected situations are the main “learning moments” of the activity, for this reason, after each of them, the lecturer (not anymore as the Big Fish) provides feedback to the team (and individuals) on how these were managed and gives advice.

Once the presentations are finished, the sharks should decide how they will distribute the budget the organization allocated to the project among the teams. Sharks have five tokens representing \$100K each (play money) that should allocate to the team(s) of their preference (see Figure 1). The team which receives the most money and has kept at least three of their confidence votes will win the project (and the activity).

4 Results and Discussion

4.1 Data collection and analysis

A Meeting with the Big Fish has been part of the course activities since 2019. Out of the 77 students enrolled in the course in the 2019-2022 period, around



Fig. 1. Confidence votes, budget, and unexpected situations cards

75% of them have participated in the activity; students have the option to opt out of participation as the activity weighs 0% in terms of the course assessment items. Following the completion of the activity, students answer a standardized questionnaire to evaluate the gamified aspects of the activity using a 5-point scale. The questionnaire results have shown excellent results as the activity is attractive (Average: 4.36; Median: 5); it suits the students' way of learning (4.73; 5); the content is connected to what they have learned (4.73; 5); it is fun (4.91; 5); the level of challenge is adequate (4.45; 5); students would do it again and recommend it to their peers (4.82; 5), and they felt it contributes to their learning (4.73; 5).

The questionnaire also includes a section where students are asked to select the LOs that they believed were addressed during the activity, and, in its last section, students can provide free text opinions regarding their participation experience.

Regarding the LOs, LO2, and LO9 were chosen by 81.8% of the students, while LO3 and LO8 got 72.7% and 54.5%, respectively. The free-text opinions from students are presented in the next subsection.

4.2 Upsides and downsides

An important part of the activity is the fact that its objective is to make the students live a tense and challenging learning experience (they are aware of it since the lecturer explained it beforehand, giving students the opportunity to ask questions). Nevertheless, this has not been an impediment for being an enjoyable experience that increased student engagement through fun, which is consistent with findings of previous SE gamification studies [6]: *"It was really fun and nerve-wracking. Thank you for organizing such a wonderful event". "I definitely liked the whole setting, having other people there acting as technical*

Table 1. Unexpected situations.

Before the meeting ...
You are entering the headquarters of one of the top-5 richest people in the world. So, immediately after you arrive, you and your team must verify your identity by showing an ID. You are in trouble if you do not have an acceptable proof of identity.
Having sorted the first obstacle, you reached the 20 th floor of this state-of-the-art building. You realize you do not have access to the WiFi; the security policies are very strict. If your slides are in the cloud only, you have to wait around 45 minutes until the IT department grants you access to the internet.
During the meeting ...
One of the organization’s experts is a Mr. Wise Guy, but after a couple of interventions, you realize that they are attending the meeting to find your weakest spot and exploit it. Now, he is criticizing you “Why aren’t you using the <super duper> model/standard? It is used by many European and US organizations with huge benefits.” What would you do if you don’t know that model/standard?
The CEO’s assistant enters the room to inform them that the city council is on the phone. “Apologies, but I must take that; thank you for coming.” You took more than the 6 minutes allocated to you.
After the meeting ...
Great presentation! The CEO is authentically interested in your solution. But, their “right hand” is whispering to their ear: “We have to get rid of some ‘obstacles’” Then, the CEO asks you: “Who should we fire?” What would you do?
You know that you are capable; you have the knowledge and the team to implement the proposal successfully. However, given the small size of your startup and its short history, the CEO asks you: “How will just three/four of you be capable to carry out this millionaire project?” What would you do?

advisors to dissect what you were saying was a fun challenge ... I enjoyed the challenge, and the fast and hard nature of taking the meeting”.

The authenticity of the unexpected situations brings realism to the learning experience of the students, and it is much appreciated: “... *the use of unexpected scenarios made the exercise more challenging but made you think about potential real-world problems ... it was a good way to prepare us for the kinds of questions we may face in the industry*”. “*Had an awesome experience, one of the most personalized fun experiences I’ve ever had in a ‘standard’ lecture these will be some of the educational side memories from uni that I’ll remember. I really enjoyed meeting the big fish*”.

On the negative side, this type of activity may not be suitable for all learning styles, so this can be a potential cause of students deciding not to participate in it. Although every year the participation rate has been around 75% of the enrolled students and, so far, no negative comments have been received. It is worth mentioning that participants have come prepared and taken the activity seriously. From those students who participated, the main issue they mention is the “lack” of details provided to them: “*I didn’t like how unexplained the activity was, was hard to prepare for [the pitch] and there was little documentation about*

it”. However, one of the activity’s goals is for students to be capable of anticipating potential challenges or changes and to build a readiness mindset that enables them to face ambiguous or unpredictable situations with confidence. Overall, the positive feedback and observed effects surpassed the potential negative ones.

5 Conclusions and Future Work

In educational contexts, game elements have shown important benefits to students’ attitudes, motivation, and interest, improving their learning experience as a whole. Pitching their own work, in this case, an assignment has contributed to the development of the presentation and communication abilities of students enrolled in a Software Quality course. A Meeting with the Big Fish combines pitching and SPI knowledge into an activity that has been exhibited to be a fun, enjoyable, and meaningful learning experience for students. In future work, we expect to formalize the activity steps so they can be replicated to obtain feedback from other educators.

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