Implementation of an agent-based simulation for Audiology trainees

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Research context
This research is linked to the Immersive Learning through Virtual Reality project implemented at the HITLab. Its aim is to provide students in the Master of Audiology programme with virtual clients to supplement their training. The simulator will allow students to practice assessment and rehabilitation of hearing disorders with a realistic virtual human. For instance, students conduct a standard assessment battery with the human-like virtual client. Then, they must interpret and use these answers to plan rehabilitation or interventions.

The project arose from the recognition of both needs and opportunities for the development of a virtual environment for training audiologists at University.

What is being researched?
This research aims to evaluate the educational benefits of using a computer simulation platform in audiology training. It will take place in two stages:

- An investigation of the current training methods employed in the clinical Audiology course is being conducted. Experts in Audiology are collaborating with us to create a set of scenarios for the simulation platform based on their clinical experience.
- A study will be conducted to determine if using virtual patients in settings that require to rearticulate questions during the medical interview can impacts on students trust and confidence in the system. Also students’ engagement during the interaction with the virtual patient as well as their perceived level of authenticity will be tested.

Development
We build upon a VR platform developed by the Virtual Patients Group Consortium and adapted this system for our purposes. The initial platform was upgraded to work as a standalone application on a desktop computer. This was necessary to make the system more accessible and easy to use.

Application designers, developers and domain experts in audiology and communication disorders worked on the requirement analysis and discussed what aspects the new learning platform should encompass. As a result a prototype simulation was designed and implemented.

What are the benefits?
- Students gain practice and confidence in a “safe environment” prior to engaging with real patients.
- In actual clinical practice students can spend most of their time practicing on patients suffering from the same conditions and have little exposure to less frequent clinical cases. Our platform offers control over the clinical cases examined by students in order to also let them to train with low frequency events.
- Students can practice in their own time and conduct self-assessment through formative and summative feedback. This enables students to reflect on their progress throughout the training process.
- Reduced time commitment for clinical educators compared to traditional classroom activities in clinical education.
- More resources to train students and therefore a potential for higher student numbers.

What is the future research?
The next step is to have audiology researchers to work alongside with the application developers to design content and meaningful scenarios for the simulation. We also plan to gather more data to lead the application’s implementation through studies with communication disorders and audiology students.

Finally, once enough scenarios are implemented, a study will be conducted as part of the clinical Audiology course to determine the educational outcomes of the additional Role-play activities provided by this simulation platform.

We are in the process of extending the system to other fields requiring clinical practice (e.g. nurse trainees).