Pilots Completion Report

Document details

Document owner	Rachel Purcell
Document author	Rachel Purcell
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Title of the Pilot	Eating, drinking & swallowing pre-registration competencies and virtual reality simulation: Evaluation of student experience and learning
Pilot ID Number	**FLP-Pilot-ID89**

Pilot Completion Report Template

Report Category	Report Requirement
Overall Rating *(Fully Delivered, Partially Delivered, Not Delivered)*	
Summary	This pilot aimed to investigate whether the use of virtual reality (VR) simulation was a viable teaching method for acquiring practical clinical skills for the assessment and management of eating, drinking & swallowing difficulties (also known as dysphagia) in speech & language therapy (SLT) education. Namely, if year 2 SLT students would find the use of VR simulation an acceptable teaching method and whether the use of VR simulation could increase student confidence levels in the practical clinical skills required for the assessment and management of clients with eating, drinking and swallowing (EDS) difficulties. RCSLT introduced new curriculum requirements which are mandatory for SLT students graduating from 2026. SLT students will be required to demonstrate several practical clinical competencies in the assessment and management of patients with EDS difficulties. Due to limited placement capacity in the North West, the SLT teaching team at UoM has been at the forefront of developing experiential learning methods (such as case-based and video/actor simulation learning) to support students in developing these practical skills. A bespoke VR simulation and debrief workbook were designed to meet specific clinical learning outcomes, based on the RCSLTs Pre-Registration Eating, Drinking & Swallowing competencies e.g. 'Recognise the signs and symptoms of oropharyngeal and oesophageal dysphagia to inform diagnostic hypotheses'. The VR simulation was designed in a hospital setting, where participants met and spoke to Dennis, a 72-year-old man who had recently been admitted with a chest infection and was able to describe (when asked appropriate questions) a gradual onset of swallowing difficulties, including the sensation of food sticking in his throat which occasionally resulted in choking and nasal regurgitation. Participants were prepared for the simulation using their workbook which instructed them to reflect on and plan what questions they might need to ask Dennis to help plan their next assessment/intervention, as well as what information they might need to start forming a diagnostic hypothesis.

	Proportionate ethical approval was granted by the University's Research Ethics Committee (UREC) on 24 February 2025. We recruited 20 year 2 SLT students to participate in the study. Year 2 students were selected as they had completed their theoretical teaching on EDS difficulties in semester 1. 18 students completed the VR simulation experience on 29 April 2025 and 16 students completed the focus group discussions on 30 April. The focus group discussions involved students meeting in small groups (up to 5 participants per group) with one of the SLT teaching team. Each group interview lasted 60 minutes, where 30 minutes was assigned to discuss and reflect on their clinical learning experience and 30 minutes exploring their attitudes towards the use of VR simulation. Students were also invited to complete a pre- and post-simulation experience online survey (hosted by Qualtrics XM) to rate their confidence levels in the targeted EDS clinical skills and their attitudes towards the use of VR in education. 15 students completed the questionnaire for both pre- and post- conditions. Quantitative data from the pre- and post-simulation questionnaires was compared which showed 60% (n=9) of participants rated themselves as having higher levels of self-confidence in 80% of the targeted competencies and all participants gained in confidence in at least one of the targeted 8 EDS competencies. 73% (n=11) of participants reported increased levels of agreement with at least 80% of statements about the perceived usefulness of VR for their learning. 80% (n=12) of participants reported increased levels of agreement with at least 80% of statements about the ease of use of VR technology. Audio recordings from focus groups were transcribed and analysed for themes, which included: - Student appreciation of the immersive nature of VR which helped to simulate a real clinical environment and a 'safe space' for learning - The VR experience provided them with the opportunity to practice structured conversations with clients ('clinical scripts') which they felt would help to prepare them for real-life clinical interactions - Students struggled to link and apply some theoretical teaching from semester 1 to the VR simulation in semester 2 and wanted the simulation to be timetabled to align with relevant lectures (i.e. semester 1 of the second SLT year) - There were some limitations inherent in the design of the VR simulation which some students found difficult to navigate e.g. not being able to talk to a relative or nurse. Dennis's speech was also noted to lack emotion which made him difficult to 'read' as a patient and masked some

	of his reported symptoms (e.g. changes to his speech and voice quality) - Overall, students appreciated the VR simulation experience and considered it a valuable addition to SLT education. Requests for more use of VR simulation in SLT education was also a common theme across group interviews. These findings indicate that the use of VR simulation is both a viable and welcomed addition to the SLT programme at UoM.
Deliverables	1. The VR simulation, Dennis Foster Inworld' VR programme, is to be timetabled in the SLT programme in year 2, semester 1. 2. The SLT teaching and VR teams will make adjustments to the VR programme for 'Dennis' following qualitative feedback collected from students. Changes include: (a) ensuring Dennis's report of symptoms are consistent when questioned about his eating and drinking, where student feedback noted that he occasionally contradicted himself about what he could and could not manage to swallow safely; (b) investigating whether the Dennis's programming can be amended to reflect his description of symptoms e.g. where he describes his voice as 'coming through his nose' (AKA hypernasal speech) 3. The research assistants (current year 3 SLT students) for the project will be presenting the successful outcome of this pilot as part of their presentation on SLT internships at the UoM Teaching & Learning Conference 2 & 3 July 2025. 4. Following the positive outcome of this project, the SLT teaching team will be exploring the development of VR simulation for other SLT clinical populations.
Relevance	The pre- and post VR simulation surveys were analysed to investigate whether participants in the study had self-reported changes in confidence in specific clinical skills required for the assessment and management of patients with EDS issues. Of the 15 participants who completed both surveys, 60% (n=9) rated themselves as having higher levels of self-confidence in 80% of the 8 targeted competencies. All participants reported an increase in confidence levels in at least one of the targeted competencies. The Technology Acceptance Model (TAM) survey (Orruño et al., 2011) was evaluated for pre- and post responses from 15 participants. The survey is divided into two sections, with 6 questions on the perceived usefulness of VR in healthcare education and 6 questions on the ease of use of VR technology. 73% (n=11) of participants reported increased levels of agreement with at least 80% of statements about the perceived usefulness of VR for their learning (e.g. 'Using VR would enhance my effectiveness on my learning for clinical placements'). 80% (n=12) of participants reported increased levels of agreement with at least 80% of statements about the ease of use of VR

	technology (e.g. I find it easy to get VR to do what I want it to do). This aligns with the Fleixle Learning Strategy of providing students with accessible educational experiences and preparing our students for a digital future. Although some of the quantitative outcomes from this study are not as high as the expected outcomes (where 80% of participants were predicted to demonstrate increases in self-confidence for the 8 targeted RCSLT (2021) EDS competencies and the perceived usefulness of VR), the qualitative data from the thematic analysis of the focus group interviews offers strong support for including and developing the use of VR simulation in SLT education. Students offered positive comments about inclusion of VR simulation into the SLT curriculum design e.g. "*I think it would be really great to combine it (VR simulation) with our lecture learning because it gives us the space to act as leader and not just passively get information. I think that would really help with actually memorising the theory from lectures because what I've found is going home and writing your notes down and then going through them one month or two months later, you have to revisit them all the time but with this I think it would be much more deep in your mind*." The overall aim of the project was to establish whether SLT students (our key stakeholders) would find the use of VR simulation an acceptable teaching method and whether using VR simulation would be a viable additional teaching tool to helping students work towards EDS clinical competencies. We believe our findings support this outcome, especially given that a theme of the qualitative data was that students wanted the programme to develop *more* VR simulations for other clinical caseloads. As access to clinical placements is limited in the North West (with competition from UCLAN and MMU SLT programmes), VR simulation has the potential to expose our students to a wider range of clinical populations e.g. as one student commented, "*There's going to be areas we've not looked at or seen so having access to a clinical area, like especially if it's an area you're interested in and you've only seen it once before you graduate and start working, it would be great to just go into a simulation and have a go*." As well as integrating the Dennis In-World VR simulation to the current curriculum, the development of more VR simulations specific to SLT education will offer our students more flexible learning opportunities in the future. Orruño E. Gagnon M-P. Asua J. Ben Abdeljelil A. (2011). Evaluation of teledermatology adoption by health care professionals using a modified Technology Acceptance Model. *J Telemed Telecare*. 2011;17:303–307.
Efficiency	This pilot was carried out with no additional staffing from the teaching team but with support from two research assistants to

	help with data transcription and analysis. Although the initial 'set up' for the study was time consuming, we envisage that the ongoing use of the VR simulation in SLT education in 2025/26 will be an efficient use of teaching time. Clinical debrief discussions will still need to be timetabled and staffed by the SLT teaching team, but the VR simulation can be accessed by SLT students with minimal supervision from the SLT teaching team.
Effectiveness	Thematic analysis of the audio recorded focus group discussions explored which aspects of the VR simulation students found both challenging and effective. Themes which students found effective included: - The immersive nature of the VR simulation to create a 'real' clinical environment and a safe space to practice clinical skills in: "*It was like you were there… it was really good*." - Being able to take a 'lead' in the clinical scenario (whereas in group video simulations students share this responsibility): "*I felt quite comfortable in the VR setting compared with classmates or real patients*." Some of the limitations of the VR experience included the restrictions on Dennis's presentation, including the lack of realistic voice and speech quality compared to the symptoms he was describing. We plan to meet with the VR software development team to explore if Dennis can be updated to reflect a more realistic patient presentation. The timing of the VR simulation was also a theme (*"If we did this during our dysphagia lectures, it would've made more sense"*), where students wanted to access the simulation to align with the relevant teaching in semester 1 of year 2. This has been addressed with the scheduled teaching for year 2 in 2025/26, where the VR simulation will be integrated to correspond with relevant lectures on EDS difficulties.
Outcome	Data from the pre- and post surveys as well as thematic analysis of the focus group discussions has demonstrated that participants viewed the use of VR simulation as a viable teaching method to contribute to their SLT education. Overall, the VR simulation was positively received by students, which has resulted in the use of the VR simulation being integrated into the 2025/26 SLT curriculum. The SLT programme plan to investigate how further VR simulations can be designed for SLT students to enhance their clinical learning journey and be embedded into the SLT curriculum for other clinical areas.
Sustainability	The use of AI to generate Dennis's avatar has inherent issues with environmental sustainability, for example with the use of critical minerals to create microchips and water consumption needed to cool electrical components (e.g. see: *https://www.unep.org/news-and-stories/story/ai-has-environmental-problem-heres-what-world-can-do-about*). However, the use of VR simulation offers some sustainability solutions to the SLT programme who have relied heavily on video

	simulations. Video simulations are time consuming to create and rely on consent from patients who are often in care settings. As SLTs often work with patients who do not have the mental capacity to consent to being video recorded for education purposes, this inherently limits the range of clinical scenarios we can use for simulation teaching. Furthermore, recordings of patients can only be kept for 4 years and need to be securely stored electronically. The use of VR simulation means the SLT teaching team do not need to routinely replace patient videos and have access to a wider range of 'patients' and clinical conditions. As there is ongoing competition for local clinical placements (where MMU run both an undergraduate and Master's SLT programme and UCLAN run a SLT Master's programme), access to VR simulations to ensures our students gain exposure and experience working with patients with EDS issues and that the SLT programme at UoM continues to meet the RCSLT EDS curriculum requirements.
Financial	The project came in slightly under budget. The recruitment of the Research Assistants (RA) was originally costed using the student partnership model. The job descriptions and funding available meant we had to recruit using casual worker contracts and reduced the proposed working hours to reflect the increase in hourly pay for RAs. This did not affect the project management, and the RAs were able to fulfil the job description requirements in the reduced allocated hours.
Lessons Identified / Learned	The scheduling of the VR simulation project was constrained by timings required of the FLP pilots. Ideally, the VR simulation would be scheduled in semester 1 to complement relevant clinical lectures. This was one of the themes from the group interviews and accordingly, we have timetabled access to the VR simulation to semester 1 of year 2 teaching to align with relevant lectures in response to this student feedback. Students found some of the aspects of the simulation reduced their ability to immerse themselves and 'suspend disbelief. For example, Dennis's voice lacked some of the qualities we would usually expect in a clinical scenario with a patient at risk of EDS difficulties e.g. one student commented "*Obviously, it's like an AI voice but in real life if someone's got a really wet sounding voice you can pick up on things or … I don't know, if someone's showing signs of like dysarthria or something, that can be a sign of neurological conditions that are also linked to dysphagia but obviously that's nothing wrong with the system, it's very hard to develop like a naturally sounding dysarthric voice*." Further work will be pursued with the VR software developers to investigate whether these aspects of the simulation can be altered to be more realistic. Currently, FMBH does not have a policy or strategy for the use of VR simulation across the faculty. We are aware of other

	colleagues who are developing VR simulations for healthcare education at UoM. A central approach for the sharing of good practice and resources would be beneficial to the longevity of use of VR simulation and likely improve the student experience (for example by providing access to more simulations for them to practice clinical skills in). The provision of the VR lab in Booth Street East is an excellent resource for our students. The ease of booking provides a flexible approach to learning for our students as well as helping them to develop essential digital skills.
Materials or publications	Dennis Foster Inworld' VR programme, delivered using VR headsets (HTC Vive Focus 3). VR simulation SLT debrief workbook created for the Dennis In-World VR programme.
Report approval and comments	*To be completed by a delegated person agreed by the workstream governance group.*

Cost Type	Description	Costs and Total
Staff	*Rachel Purcell, Clinical lecturer, 0.2 FTE* *2 Research Assistants (casual worker contracts, grade 5, 47 hours each at £17.38/hour). However, accounting for holiday pay & ENIC, hourly costs has been adjusted to £22.17/hour to ensure costs stay within the budgeted £2100*	*n/a* *94 hours x £22.17 =* ***£2083.98***
Non-Staff	*3 digital recording devices (72GB Digital Voice Recorder with Playback, Innioasis R1 Full Touchscreen Voice Recorder with AI Intelligent Transcription and Bluetooth, Voice Activated Sound Audio Recorder Device with Mic (Black))*	*3 recorders at £55.99 =* ***£167.97***
	Software update for 'Dennis In-world' VR simulation	*£2200+VAT =* ***£2640***

	Participant thank you vouchers	*£20 each x 16 participants =* ***£320***
Adjustments	*£250 costed for digital voice recorders. Total real cost was £167.97*	***+£82.03*** *(digital voice recorders)*
	Software update was originally costed at £2500 but developers changed this to £2200 + VAT (£2640)	***-£140*** *(VR software update)*
	£20 participant thank you vouchers – had originally aimed to recruit 25 students at a cost of £500, but only 16 students completed the whole study (total cost £320)	***+£180*** *(Thank you vouchers)*
Final reconciliation	*T*otal estimated cost = £5350 Total real spend = £5211.95	*Under budget by* ***£138.05***
Request for payment	*The payment in the next box should include all staff costs, non-staff costs and adjustments total.*	*Total staff costs:* ***£2083.98*** *Total non-staff costs:* ***£3127.97*** *Total adjustments:* ***+£138.05*** *Final reconciliation:* **£5211.95** *Total request for payment:* **£5211.95**