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Development of a virtual reality simulation for practitioners

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ABSTRACT

Within social work education there has been extensive interest and use of simulation for learning purposes. In recent years, this interest has broadened to the use of Virtual Reality Simulation (VRS) for teaching because of the benefits that include a safe environment in which to learn, flexibility and self-efficacy. Several examples of VRS have been developed that range from specifically designed computer-based programs through to Google Cardboard VR. While such efforts are to be lauded, what is missing is a deliberate attempt to build on the knowledge of such developments. This article will detail the creation and implementation of a VRS with Social Work and Early Help practitioners, but unlike previous examples, the study builds on the practitioners' sense of presence and reality. In doing so, it was found that the practitioners' practice experience and knowledge influenced their perception of the VRS. This finding has significant implications for the development of VRS for social work, in particular showing that there is a need to make a distinction between students and practitioners, and to appreciate that learners are not passive beings.

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Introduction

The potential and possibilities of simulation and, more specifically, serious games for learning have been of interest to academics for a considerable number of years (see Dodds et al., 2018; Kourgiantakis et al., 2019; Lee, 1999; Logie et al., 2013; Randel et al., 1992; Reinsmith-Jones et al., 2015; Vogel et al., 2006; Wilson et al., 2013). As part of a meta-analytic review, Sitzmann's (2011) examination of the instructional effectiveness of computer-based simulation games identified that this method was found to be 17% more effective than lectures. In a similar vein, it was shown to be 5% more effectual than discussion groups. Simply put, when simulation games are used for educational purposes, as well as being developed and employed appropriately for learners, they can enhance learning outcomes (Sitzmann, 2011, p. 514). Sitzmann (2011) also strongly inferred as part of his meta-analytic review that simulation offers effective learning in the form of self-efficacy, declarative and procedural knowledge and also retention (p. 513). He went on to add that by learners repeatedly engaging in simulation it may increase their

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confidence to remember and subsequently apply the information taught Sitzmann (2011).

However, before looking at developments of VRS within social work, it is important as authors that we define what we mean by virtual reality, and in so doing briefly demonstrate the range of simulation that has been developed over the years. The expression 'virtual reality' is used here as an umbrella term. There are authors who describe virtual reality as being computer-based simulation in a virtual environment; for example, Tandy et al. (2017); Reinsmith-Jones et al. (2015) and Washburn et al. (2016). Other authors such as Singh Conner (n.d.) and Wilson et al. (2013) define it as two-dimensional or three-dimensional simulations which make use of a headset, sensory gloves and immersive video apps. In terms of what constitutes two- and three-dimensional simulations there are two distinct types that are available. The first is low fidelity which constitutes case studies and role play. The literature in relation to low fidelity simulation highlights that actors or 'standardized patients' are by far the most common type of simulation used in social work. This entails the involvement of actors or role-plays with other students. This type of simulation is often easier to arrange, and the use of actors as standardized patients can give a more authentic feel to a simulation and allows for a more standardized experience for students (see Kuliukas et al., 2017). Another approach that constitutes low fidelity simulation is videos, for example Goldingay et al. (2018) and Asakura et al. (2018). This approach has received positive reactions on the part of students because of its realism and authenticity; however, there is limited opportunity to change the content.

The second type of simulation described in the literature is high-fidelity. This comprises Virtual Reality Simulation (VRS) where real-life scenarios and work contexts are replicated and recreated with a view for both practitioners and students to learn social work practice in a safe environment without causing harm to anyone. The potential promise of VRS can be recognized through the systematic literature review undertaken by Vlachopoulos and Makri (2017). They concluded that VRS allowed students to observe the outcomes of their actions which was found to be a key component in enabling them to reflect on their problem solving and decision-making skills. Hence, students' learning experience became active, experiential and transformative. From a social work perspective, Doel and Cooner (2002) comment that VRS can be used to develop unusual or challenging scenarios that may not occur naturally for learning purposes. Other positive attributes of VRS include that it can be manipulated to focus on individual student's learning style and pace, pays attention to the characteristics of real-world practice and provides a concrete connection between theory and practice. Additionally, it enables problem solving, promotes the assessment of risk and critical thinking (Foronda et al., 2017; Huttar & BrintzenhofeSzoc, 2020; Kourgiantakis et al., 2019; Nimmagadda, 2014, p. 540; Reeves et al., 2015, p. 350).

Examples of this include computer-based simulations such as that of Wilson et al. (2013) where they made use of 'Second Life' (a free, computer-simulated, multi-media environment in which players create their own content and engage with other users in a multi-player online world). Students were provided with the opportunity to practice engagement and assessment skills via a home visiting simulation in Second Life, an experience that allowed them to appreciate the complexities that can be encountered when undertaking this aspect of practice.

More recently, social work academics have been using a spectrum of VRS approaches that have ranged from Google Cardboard VR through to computerized-based scenarios. They have shared details of the simulations they have created and the implications in terms of learning. Examples include Reeves et al. (2015); Washburn et al. (2016) and the use of Google Cardboard VR (see Blakeman, 2018). In the case of Washburn et al. (2016) they reported on a pilot study that utilized virtual reality simulation of a patient, allowing social work students to develop their assessment skills. Their approach allowed students to engage to see a life-sized simulated patient that was able to respond to questions using voice recognition. Advantage of this when compared to OSCE was that the scenario could be repeated multiple times and students commented that they felt prepared to work with clients in real life practice settings (p. 687).

A further example is that of Egonsdotter et al. (2020) using a computer simulation, 'SimChild'. The purpose of the simulation was to enhance the cultural competence of students. The aim was to enable students to become aware of how their unreflective thinking can affect their assessments and decisions in child protection cases (p.365). The findings of the study were that using a computer simulation allowed students to answer freely and honestly; and then the lecturer was able to use the aggregated data to lead a reflective discussion using the students' responses (Egonsdotter et al., 2020). A vital component regarding this example was that the authors identified that authenticity and realism of the virtual scenario were key factors for engagement and to enable reflective thinking by the students (Egonsdotter et al., 2020, pp. 373–374).

Despite the rich array of teaching modalities using VRS and its versatility, there are a number of gaps in terms of knowledge and research. The literature review by Huttar and BrintzenhofeSzoc (2020) regarding the use of VRS and computer simulation in social work indicates that there is little use of it in post-qualifying education. They go on to comment that this represents a lost opportunity to further strengthen the competency of practitioners (p. 137). The authors further identify that there is also insufficient research in relation to how VRS can be used to strengthen macro-level skills such as advocacy, community building and legislative practices. An earlier review of the literature by Logie et al. (2013) identified the failure of social work educationalists to build on the research knowledge that was being published. The authors would echo the criticism by Logie et al. (2013) in that all the studies mentioned thus far do not explicitly build on what has been learnt to date. Moreover, they give little attention to the experience of VRS by the end user (student) other than within the confines of whether it was enjoyed, was realistic or made a difference to learning and practice. This paper aims to intentionally build on the work of Egonsdotter et al. (2020) and Blakeman's (2018) where mention has been made of presence and a sense of reality. Specifically, we shall make use of Shin's framework of affordance (2017). Our aim is to not only share details of the pilot simulation but also to delineate the way in which learners (practitioners) experienced the simulation. In particular, it highlights how their cognition, in the form of practice experience and knowledge, influenced their perception of the VRS. In so doing, we shall also identify the challenges associated with developing VRS for practitioners.

Developing a successful VRS that is inclusive of realism and authenticity

Before providing details of the study, it is important to outline some of the critical components of VRS that serve to enhance the learning experience in terms of it being realistic and

authentic. Moser and Fang (2014) argue that the degree of learner engagement within an interactive narrative lies with their perceived control over the avatar character (p. 623). This engagement extends to the degree to which learners can make decisions that are akin to real life practice. This characteristic is achieved through what is called a branching narrative as it provides immediate feedback to the learner, which supports further engagement and immersion. A branching narrative is a tool within story telling that allows the end user to choose between different actions or storylines. Therefore, the end user is not passive but active in determining the outcome as a result of choices that are made. Gross et al. (2005) brings another perspective in relation to how the learner perceives the objects, properties and behaviors (also known as artifacts) that have been selected and included in the simulation's virtual world. Building on what Gross et al. (2005) have highlighted it can be argued that the learner experience also requires a sense of immersion and empathy. Inherent within VRS are several characteristics that include providing the user with a sense of both full immersion and presence within the environment. Additionally, with full immersion comes an altered psychological state in which the end user is engulfed in the virtual reality resulting in a distancing from the physical world Trahan et al. (2019) and Recover et al. (2021).

A further critical component is immersion which according to Shin (2017, p. 64), does not have an agreed singular definition and is often confused with engagement. His definition is that it represents a deep involvement in the virtual learning environment (p. 1830). In terms of empathy, one definition provided is when the learner has an understanding of others within the simulated environment, and this leads to a greater sense of realism and credibility (p. 1813). Shin (2017) also explains empathy as learners assigning meaning to VR stories. Shin (2017) provides a useful framework to consider regarding the remaining components for successful VRS, that is based on an affordance. Ahead of outlining the framework, it is important to understand the meaning of affordance. Blakeman (2018, p. 27) in explaining this refers to Gibson (1979) who described it as an interactionist perspective of what an environment offered in terms of actions that could either harm or benefit the creature. The example provided by Blakeman (2018, p. 27) is an indoor exercise bike. According to the notion of affordance it can be used for the purposes of exercise or something on which wet clothes can be hung on to dry. Since then, the term of affordance has been expanded to mean properties of the virtual reality environment that enable action on the part of the learner.

The framework of affordances for VRS posited by Shin (2017) is inclusive of presence, immersion, comfortability (usability), empathy and embodiment. A brief explanation of the key affordances relied upon for this study include:

Immersion affordance: it refers to experiencing deep involvement with a virtual learning environment. So, learners become absorbed, concentrated and engrossed in the activities. Shin (2018) has suggested that immersion can be part of a cognitive dimension which consists of consciousness, awareness, empathizing, embodying and is flexible and learner defined.

Empathy affordance: Shin (2017) found that a higher level of empathy developed due to the fact that engagement with VRS is more realistic. The content of the VRS can potentially stimulate empathy. When learners engage with the VRS they share the same space and are close to the character of the VRS. This increases a greater level of understanding about a group or topic or a person.

Embodiment affordance: an embodiment affordance refers to learners feeling they are in the simulation (p. 1831).

Nimmagadda (2014) have argued that without these affordances being present, even where it has been highlighted that pedagogy is critical to the success of a VRS for learners, there is a likelihood of imbalance. This can lead to an experience by the learner where there is a lack of realism and authenticity, both of which, as has been seen, can impact on the learning overall (see Ergonsdotter et al., 2020; Martin, 2017; Washburn et al., 2016).

Simulation description

The simulation was developed using Fieldscapes. Fieldscapes, which is based on the principles of the 5Es, a learning process model proposed by NASA: engagement; exploration; explanation; elaboration; and evaluation (https://www.nasa.gov/sites/default/files/atoms/files/the_5e_instructional_model.pdf). Fieldscapes allows educators to create their own 3D and VR immersive learning exercises for students. The students are then placed in a relevant environment to better understand the context of what they are learning. The advantage of the software is that it separates the technical task of creating the VRS environment from the pedagogy in the sense that the educator can use the editing function to further add artifacts as part of enhancing the learning experience. A further benefit of Fieldscapes is that it is web-based thereby allowing learners to access a simulation using a range of digital devices. Given that the simulation was a pilot, the authors made the decision to allow learners to simultaneously access the environment but not in a multi-user fashion. The reason for this was to increase flexibility for practitioners to engage with the simulations from anywhere and at any time.

The synopsis of the simulation is that the practitioner receives details of a safeguarding referral and in response undertakes a home visit to decide which action is required to safeguard the children in the household. The simulation begins with the learner listening to a telephone call from an individual who makes the referral to the local Children's Services duty team. The learner is also provided with previous case notes relating to the family in question because of safeguarding concerns linked to domestic violence. The next scene is that of the practitioner avatar outside the home of the family that is the subject of the safeguarding referral. The practitioner avatar knocks on the door and is met by the eldest son avatar who opens the door. The practitioner avatar then enters the home and is met by the mother avatar in the hallway. Following this, the mother avatar walks through the hallway to the living room. This is where the main interaction takes place between the practitioner avatar and the mother and father avatars. This is achieved through the use of chatbots, that is a software program which simulates conversation with human users. A further feature of the simulation is that from the front door, along the hallway and in the living room, there are a series of hazards that could potentially point to several safeguarding concerns, for example medication being left on the stairs. It was expected that learners need to identify the safeguarding concerns and share the rationale for their decision-making.

A three-part implementation approach was used that involved firstly briefing learners on how to use Fieldscapes in terms of navigating their avatar and how information would be shared, e.g. a narrator would outline details of the simulation.

Secondly, learners were debriefed regarding their decision-making and safeguarding response. Following this, learners engaged in the final implementation approach that was responding to a questionnaire associated with their experiences and views regarding the simulation.

Materials and methods

The simulation was undertaken by a total of 22 practitioners, who were recruited using purposive sampling from a local authority. Thirteen were child and family social work practitioners and nine were Early Years practitioners. Respondents from each practitioner group accessed the simulation using individual computers. As stated previously, practitioners at the end of the simulation exercise engaged in debriefing session and focus group discussions. These were facilitated through a range of questions about the scenario as part of prompting and drawing out key learning in relation to risk assessment and management, as well as factors that influenced their final decision. Furthermore, both groups of practitioners were asked about their experience of the simulation. Moreover, the facilitator of the de-briefing session asked participants what other use the simulation could be put to, for example teaching practice skills to undergraduate students or newly qualified practitioners.

Prior to the study, ethical clearance was provided by The Open University. All practitioners were provided with an Information sheet setting out the details of the study including the methodology, confidentiality, anonymity and storage of collected data. Additionally, the practitioners were given a consent form to complete. The data collected was based on the debriefing session in which each practitioner group took part.

Analysis of the data from the practitioner groups was undertaken using the thematic approach as described by Braun and Clarke (2006). The analytical approach offered flexibility in the sense of not being '*wedded to any preexisting theoretical framework*' (ibid p.81). Moreover, the analytical process involved a method that was inductive, meaning that there was a deliberate attempt to ensure that analysis of the data for each practitioner group was informed by Shin's framework (ibid). To ensure the quality of the coding process, the initial coding framework was undertaken by one author and then reviewed and agreed with coauthors through a series of discussions and progressive iterations. Details regarding the participants are provided in Appendix 1 and they are differentiated by practitioner group using the initials SW (Social Workers) or EH (Early Help).

Results

As stated previously, though practitioners were able to access the simulated environment simultaneously, the function that allowed their avatars to interact was not made available.

The thematic analysis led to three overarching themes being identified which were:

- Response to avatars and character formation
- Reflections on practice and existing knowledge
- Improvement to the VRS

Theme 1: response to avatars and character formation

When providing feedback on the avatars involved in the virtual scenario, both participant groups expressed difficulty in understanding the lack of response by the father avatar, and the fact that their practitioner avatar could not seamlessly engage with him to ask further questions as part of their hypothesis forming and testing:

SW1: The relationship between parents, the fact that dad is not part of the visit as such and mum has to nudge him to say, what do you think, and there is no acknowledgment of him, even when you walk in the house

EH1: No, the dad just sat there and didn't pitch in

Concerns were also raised about the avatar named Adam (eldest son), both practitioner groups commented upon how unnatural it would be for them not to engage with him, as part of trying to build a relationship with different members of the family.

SW1: And then you would have said to the boy, is your mum around, so you wouldn't have just stood there when he went to walk off, is mum or dad around, you would automatically have asked. Anyone would ask that.

Yet despite the concerns raised about the authenticity of the avatars, the practitioners were able to formulate a range of hypotheses about the household. In the case of the father avatar, practitioners used information from the case notes and referral to assess his behavior:

SW3: And we're just making assumption that it's the dad because he's in the army, that makes him like a bit rufty-tuftly and he's going to be the perpetrator and he's not necessarily.

EH1: We could also be assuming it's domestic violence. We've seen broken objects, but it doesn't mean that it's the father being violent.

Similarly, in the case of the avatar of the eldest son Adam, both practitioner groups were able to create a rich hypothesis of what they thought might be happening in the household from his perspective:

SW4: The fact that he does—I know what older teenagers are like. Quite often they might go to the front door and not say a word and walk off. He's did that as soon as we came in, he'd gone. So, I think that was possibly a bit of avoidance, trying to run away from the situation.

EH3: I just think how he answered the door and he's like distanced himself, but it doesn't mention anything about the other son as well, so, I don't know, is he in care, has he been removed from the household?

The findings indicate that despite the difficulties the practitioners experienced with two out of the three avatars that appeared in the scenario. They were still able to develop a range of hypotheses, suggesting that the respondents had taken into account the information at the start of the simulation and had applied it to what they were seeing.

Theme 2: reflections on practice

A second theme that appeared throughout the feedback from both practitioner groups was reflections on practice in general, and specifically, their own. These reflections took the guise of making use of existing practice knowledge to inform the development of hypotheses and reaching conclusions about what should happen next. The practitioner groups also commented on the reality of practice versus what was presented as part of the simulation, and how this differed. This sub-theme is important as it also formed opinions in relation to what improvements were suggested for the simulation. Beginning with reflections on practice; the lack of dialogue practitioners could have with the avatars was interpreted as seeking to minimize the details of the referral or the mother avatar limiting the information shared in order to manage the situation:

SW5: But her responses will very much be calculated in terms of what she is willing to share because of her profession as a solicitor. It will be geared toward what you ought to know and what is relevant.

In the absence of an exchange of dialogue it was noticed that the Social Work practitioners were of the view that they could not take any action that was linked to safeguarding:

SW5: So, for us to even think of something immediate, then there is nothing to go by, and she's chosen not to engage, so we can walk away. The fact that she's not having a dialogue with us we have nothing to go by.

This lack of exchange in terms of dialogue also went on to inform the conclusion drawn by certain practitioners:

SW5: We make a lot of our assessments based on what we see, the interactions in the family. Right now, we've just not seen parents and children together.

EH4: I'd update the Duty Team for the weekend just to make sure they were aware, just in case anything went off. I would put it on their radar just in case anything came in, because there could be an escalation now that a worker has been out to the home, it could cause conflict.

Concerning the reality of practice and the simulation the Social Work practitioners in particular referred to the lack of interaction which they did not consider to be natural, and it was also deemed to be frustrating:

SW1: So, I guess that was one of the frustrating things of doing it is that you wouldn't say to the mum, 'please can I talk to the dad', when he's just sitting there, you would just talk to the dad. But it could be that there's abuse, domestic violence going on, or that the mum is being controlling of the situation or there could be a whole bunch of stuff.

An Early Help Practitioner made a similar comment:

EH1: And then you would have said to the boy, is your mum around? So, you wouldn't have just stood there when he went to walk off you would automatically have asked, 'Is mum or dad around'? Anyone would ask that.

The above seems to signify that, when faced with a complex situation practitioners rely not only on their senses, i.e. what they can see and hear, they also make use of practice wisdom (Reeves et al., 2015, p. 350).

Regarding immersion affordance, whilst it is apparent that the practitioners were able to form a series of hypotheses about the avatars, the degree to which immersion was achieved is questionable. This is noteworthy when considering the reflections on practice that were shared, as demonstrated in the reaction of the practitioners to the avatars and their frustration regarding the inability to engage in sufficient dialogue. This lack of dialogue left the practitioners questioning what was taking place, as well as how the scenario mirrored their own practice experience. Linked to this was also the practitioners' views on the simulation reflecting reality, and this in turn led to doubts about the authenticity of the simulation.

Theme 3: improvements to the simulation

The feedback provided by both practitioner groups reflected what has been highlighted in the previous themes. Firstly, improving the interaction between the practitioner avatar and the family avatars so that it is dynamic, particularly in the case of the mother avatar:

SW1: Do you think that could be an option in that, you know, you've got a choice of going from one conversation to the other, then it's up to us as the worker to decide.

Another suggestion specifically linked to the level of interaction made regarding facial expression and indications of emotion:

SW3: That would be great, wouldn't it, and to see the facial expression changing

The above suggestions feed into the other type of recommendations given which was to allow the learner to have a greater level of control over the simulation.

Social work practitioners specifically identified the need for the simulation to have a greater emphasis on key social work skills. This would seem to emphasize the value placed by the practitioners upon interaction and the importance of communication via body language and emotional intelligence, both of which reflect the fundamental skills exercised by Social Work and Early Help practitioners. What is apparent from the suggestions made is that both practitioner groups brought their contextual

understanding, which can be defined as their practice experience and procedural knowledge, to the simulation. This potentially indicates that the practitioners as learners were not passive. Such a finding is important, as will be seen in the discussion because it highlights that the learners' experience is not solely defined or can be attributed to the technological capabilities of the simulation.

Discussion

As has already been noted, both groups of practitioners, through making mention of their dissatisfaction with certain avatars, were still able to develop a hypothesis for each. This would suggest that they were able to ascribe human characteristics such as conflict between the parents; the father avatar being described as 'rufty-tufty', and the avatar of the eldest child (Adam) being described by practitioners as distancing himself and being avoidant. This would seem to infer that the practitioners were applying their knowledge from previous cases, as well as contextual understanding to each avatar and the simulation as a whole. Such a finding and the associated inference are not uncommon. The early work of Bearman (2003, p. 542) indicates that medical students engaging in a virtual patient tutorial ascribed emotions to her, and in so doing this led to an emotional response to the virtual patient that was negative. One of the findings of this study was that the students had mixed feelings that were related to whether they thought the virtual character was listening to them.

The findings from the Bearman (2003) and a similar study Johnson et al. (2005) raise a crucial point that the experience of virtual simulations by learners is not static and dependent upon the technology. Rather, as Shin (2017, 1834) has explained, the end user '*is informed by a process of reconstruction that takes place whilst the individual is interacting with the virtual environment*'. For example, this was seen in the feedback from both practitioner groups in relation to their interaction with the avatars and what realistically takes place during practice. This would suggest that the embodiment affordance of the simulation was not as extensive as the authors would have hoped, and that it was potentially weakened by the existing knowledge and practice experience that was brought to the simulation.

Practitioners also highlighted a lack of authenticity, and this is likely to have affected the empathy affordance, as evidenced by the response of the practitioners to their own avatars in the sense of not having the ability to control what it said and where it went in the simulated environment. Shin (2017, p. 66) comments that users tend to perceive the avatar actions as their own. Therefore, when the practitioners were not able to control their individual avatar to reflect their practice approach there was seemingly a disconnect, and this led to the questioning the authenticity of the encounter.

It is well documented that as part of the social work profession there is a need to build relationships with service users (Howe, 1998 and Bryan et al., 2016). This was referred to frequently by both groups of practitioners and was included as part of the suggestions for improvement. Such feedback recognized the centrality of relationship-based practice as being key to engaging with service users, and through which the practitioners felt they were able to intervene (Wilson et al., 2013). The notion of relationship-based practice has been expounded by Hingley-Jones and Ruch (2016) who describe relationship-based practice as requiring practitioners '*to look beneath the surface in order to understand . . .*

Utilising the systemic ideas of curiosity, hypotheses and multiple narratives' (p. 236). Consequently, where the practitioners were not able to direct the conversation, this is likely to represent their lack of control over the practitioner avatar. As a consequence, the practitioners reconstructed their engagement with the virtual environment according to personal experience and professional expectations. Curry et al. (2014) make the point that the personal traits of an individual end user already include what is expected, what needs to be confirmed and what will bring satisfaction. Therefore, when applying both the embodiment and immersion affordances, it can be argued that unless practitioners, from the outset of a VRS are able to perceive and make use of relationship-based practice, via their avatar, then the sense of actually being immersed (that is absorbed and engrossed) may not be achievable. The above is a testament to the complexity and unpredictability of social work. Furthermore, it raises questions regarding whether the responses by practitioners were a reflection of the simulation that has been outlined, or a specific viewpoint that virtual reality can never truly capture the realities of social work. In order to answer such a question, further research is required.

Implications for social work education

Based on what has been argued to this point, what contribution can virtual reality make to social work education? The advantages when compared to traditional cases studies and vignettes are that the learning is undertaking the simulation in real time. Moreover, in contrast to videos and Google Cardboard VR, the scenario is not static. Additionally, a virtual reality simulation can repeat the same scenario multiple times that the learner can return to, this is not necessarily the case with OSCE because of ongoing costs. Another advantage is that highly challenging scenarios can be created and used for learning purposes, a characteristic that is unlikely to occur in practice. Equally, there are disadvantages in the form of practitioners or students being unable to identify with and control their avatars, leaving a sense of disconnection (Martin, 2017). A further disadvantage is highlighted by Shin, who posits that immersion comes from the cognition of the learner, rather than the technology. Consequently, to achieve immersion and a sense of embodiment requires a recognition on the part of social work educationalists to the fact that learners who are qualified practitioners will bring with them their own experiences and traits, it is these that will determine whether or not empathy and embodiment are experienced (Shin, 2017, p. 69). The authors would conclude by stating that despite the disadvantages of virtual reality, there is a place for it in the spectrum of simulation typologies used in social work education. Our study highlights the need for social work educationalists not to be unquestionably drawn to virtual simulation but, to consider the pedagogical worth and affordances that can be achieved for purposes of deep learning.

Limitations

A key limitation of the study is that the results involved a small group of participants and therefore cannot be considered as generalizable. However, given the fact that the aim of the study is to build on existing research, the findings add to the body of knowledge that exists regarding learners and their experience of VRS.

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