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Immersive simulated reality scenarios for enhancing students' experience of people with learning disabilities across all fields of nurse education

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ABSTRACT

Poor preparation of nurses, regarding learning disabilities can have devastating consequences. High-profile reports and the Nursing and Midwifery Council requirements led this University to introduce Shareville into the undergraduate and postgraduate nursing curriculum. Shareville is a virtual environment developed at Birmingham City University, in which student nurses learn from realistic, problem-based scenarios featuring people with learning disabilities. Following the implementation of the resource an evaluation of both staff and student experience was undertaken.

Students reported that problem-based scenarios were sufficiently real and immersive. Scenarios presented previously unanticipated considerations, offering new insights, and giving students the opportunity to practise decision-making in challenging scenarios before encountering them in practice. The interface and the quality of the graphics were criticised, but, this did not interfere with learning. Nine lecturers were interviewed, they generally felt positively towards the resource and identified strengths in terms of blended learning and collaborative teaching.

The evaluation contributes to understandings of learning via simulated reality, and identifies process issues that will inform the development of further resources and their roll-out locally, and may guide other education providers in developing and implementing resources of this nature. There was significant parity between lecturers' expectations of students' experience of Shareville.

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Introduction

Learning disability is a subject area relevant to all fields of practice of nurse education. Yet in many programmes it is given scant attention. In a review of the international literature related to the factors impacting upon the care that people with learning disabilities receive, Brown and Kalaitzidis (2013) identified knowledge, skills, communication, identification of specialised needs and client centeredness as areas where nurses are particularly lacking.

Lewis and Stenfert-Kroese (2010) also identified in a study into attitudes, that unfavourable nurse attitudes impact upon the standard of the healthcare delivered to people with learning disabilities.

Such deficits have been exposed in recent years in the UK in high-profile reports (Mencap, 2007; DH, 2012). The subsequent Confidential Inquiry into Premature Deaths of People with Learning Disabilities (Heslop et al., 2013) presents robust evidence that inadequate health care is implicated in people with learning disabilities dying prematurely. Krahn and Fox (2013) reviewed health inequality related learning disability and identified a number of reports that came out in Australia and the USA at around the same time all promoting improved health care for people with learning disabilities.

In 2010, the Nursing and Midwifery Council (NMC) identified that a key standard of nursing education should be the ability of all nurses across all fields to "be able to recognise and respond to the needs of all people who come into their care including […] people with learning disabilities" (NMC, 2010 p. 17). At this time the University was developing a new curriculum for pre-registration nursing education (undergraduate and postgraduate). The need to include education about learning disabilities in a crowded curriculum meant that a technology-enhanced solution was adopted:

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Shareville (Shareable, Holistic Assets and Resources, Existing in a Virtual Interactive Lifelong Learning), developed at Birmingham City University, (http://shareville.bcu.ac.uk).

Shareville is a virtual town where students from different disciplines can interact with video scenarios in simulated real-world contexts Staley (2009). It contains an area called Elmwood house which is a residential home for people with learning disabilities, (http://goo.gl/z85f8g). The students observe scenarios and select a course of action that they think is appropriate. The consequences of these choices are then played out in another, linked video. Shareville includes a residential home for adults with learning disabilities, with a number of scenarios featuring adult residents, individually or in groups. Nursing students are thus able to respond to and reflect on lifelike scenarios not encountered in real life. Shareville allows for web links and documents to be embedded and easily accessed by students, e.g. guidance and information about good practice, service user experience videos.

Such technology-enhanced serious games are increasingly used in health education. The term serious gaming has been used for sometime and indicates an "educational purpose mixed with the gaming nature" Ricciardi and De Paolis (2014). They have been used in a wide range of subject areas such as computational problem solving Liu et al. (2011) and engineering Deshpande and Huang (2011) A systematic review by Connolly et al. (2012) showed that serious games can impact on learning positively, particularly "knowledge acquisition/content understanding and affective and motivational outcomes". In research undertaken in the Netherlands, Wouters et al. (2013) found that serious games did encourage more learning but did not necessarily affect motivation, and that such learning was enhanced by other instruction methods and group based activities. Graffland et al. (2012) found that serious games have advantages in teaching technical and non-technical skills in medical education, but that resources may not be fully tested and validated. Whilst Shareville may not fully be described as a serious game, it does contain elements of a gaming approach in that the student can to some degree control the events that occur in the simulation as they would when engaging with more advanced gaming technology.

Another variation of the serious gaming approach within health care education was developed in the UK by the University of Cumbria in their development of Stilwell. Stilwell is an online simulation of a fictional town. Walsh (2011) describes the use of narrative pedagogy whereby videos were created about characters in order to provoke thought and learning around various issues that were facing these characters. Stilwell shares similarities with "The Neighborhood" developed in the US by Giddens (2007). The Neighborhood also uses storytelling and narrative around characters that reside in a simulated town. The students are given information over time about the characters allowing them to develop case-management skills in real time. Both Stilwell and The Neighborhoood adopt a longitudinal approach in order for students to fully engage with the characters and for them to become real. The information is given to the students over a period of time. Shareville is delivered in a single session. There is a similarity between Shareville and Stilwell in that the topic of learning disability and stigma is covered from a number of perspectives within Stilwell. However where Stilwell has much greater fidelity in the creation of high quality videos using professional actors, there is limited interactivity from a gaming perspective with the resource.

Many students undertaking nurse education may never have the opportunity to gain practical experience of working with people who have learning disabilities during their training. They are unlikely to have a placement specific to learning disability and their first experience of people with learning disability will be in a generic setting. Peddle (2011) advocates that simulation and gaming can enable students to develop and apply their learning to situations that they may face in future practice in way that reduces risk to the student and service user.

This paper aims to discuss the implementation of Shareville in the undergraduate and postgraduate pre-registration nursing curricula; the choice and development of scenarios; and present findings of the evaluation by students and staff. Chickering and Gamson (1987) outlined seven key pedagogical principles that should be key features of quality undergraduate education. Jeffries (2005) used these principles to outline a model for evaluation of online simulation. They key aspects of quality simulation resources are: active learning, feedback, student–faculty interaction, collaborative learning, high expectations, diverse learning and time-on-task. Shareville will be compared against these features in the final discussion section.

Implementing Shareville

The University runs a program of nursing education that covers all three fields of practice which are adult, child and mental health both at undergraduate and postgraduate level. All of the students on the program regardless of which level or field of practice they are enrolled in were required to receive education around Learning Disability.

The Shareville residential home material was originally designed for use in Learning Disability nursing education. Consequently some adaptation of the content was required to make it more generic, and, since the focus was on adults with learning disabilities, to include children. The University secured an exclusive contract with Birmingham City University to use and adapt Shareville.

The new scenarios for adult and mental health nursing students focused on areas such as introductions to a person with learning disabilities, coping with challenging behaviour, action to be taken in the event of a seizure and role-modelling positive behaviour. Resources for child nursing students were based on the experiences of parents of children with Down's syndrome, autism and attention deficit hyperactivity disorder. The adult resources focussed on actors portraying people with more generic learning disabilities. This enabled students to consider a broad perspective of behaviours and communication issues related to having a learning disability rather than a specific diagnosis.

To optimise participation in Shareville, students used Shareville in classroom sessions facilitated by teaching staff, blending both independent and group work. The teaching room used allows for computers to be pushed down into desks when the computer-based aspect of the session is complete, to facilitate free-flowing communication. An electronic workbook was developed to guide students through the environment during the session. Each session was led by two members of staff, one with expertise in learning disability and the other with expertise in adult, child or mental health nursing, as appropriate. Group size varied from thirteen to twenty-three students (a total of 182 students attended).

Students started the three-hour classroom session with a group discussion of students' personal and professional experience of people with learning disability. Students were encouraged to talk about experiences both positive and negative, and to explore their own values and attitudes. They were then fully briefed on how to use Shareville. They worked through Shareville at their own pace, experiencing the simulated reality scenarios and collating information and reflections in their workbook. This took around an hour. After a break, students discussed their experience in small groups, and identified key considerations that they would need to incorporate into practice to enhance the quality of care delivered to people with learning disabilities.

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Ethics

Ethical approval for the evaluation research was granted by City University London School of Health Sciences Research Ethics Committee in November 2012, ref: Staff/12-13/23. Informed consent was obtained from all participants and they were given a full participant information sheet, outlining any potential risks and that they were free to withdraw at any time.

Evaluation of Shareville

Methods

An exploratory, qualitative research design was chosen to evaluate Shareville, using semi-structured interviews to explore the experiences of students and session leaders. Participants were drawn from the staff and students using Shareville in the classroom as part of the undergraduate and postgraduate Adult, Child and Mental Health Nursing programmes. Staff were invited to participate in interviews before, and approximately one week following the sessions that they facilitated. Nine lecturers were interviewed. Semi-structured interviews focused on expectations, experiences and reflections on using Shareville in blended learning. Interviews (both pre- and post-sessional) were conducted face-to-face or via telephone, and lasted 10–15 min and subsequently transcribed.

Students were invited to participate in interviews by the researcher during the Shareville classroom session. A £10 voucher for a high street store was offered to students as an incentive to participate. Semi-structured interviews with students focused on their experiences and understandings of using Shareville, its usability and acceptability, and the application/transfer of learning. The interviews were undertaken at the student's convenience in the two weeks after the session and lasted between 10 and 25 min. Interviews were recorded and transcribed verbatim. A total of nineteen students were interviewed.

Inductive thematic analysis (Boyatzis, 1998) was used: this is a rigorous method for identifying, analysing and reporting patterns (themes) in the data, yielding a rich and detailed account of phenomena (Braun and Clarke, 2006). Interview transcripts were read and re-read, and initial emergent themes were noted. Through re-reading, sifting and refinement, initial themes were expanded or merged, and discrepant data were sought.

Findings

Interviews were conducted with nineteen students recruited from seven sessions. Five were undergraduate and fourteen postgraduate, six were mental health, nine were adult and four were from child; Nine lecturers were interviewed in total. Three lecturers were interviewed once and six twice.

Student interviews

The findings from the nineteen student interviews were organised into five main themes relating to: learning, clinical practice, functionality, fidelity and pedagogy.

Learning

Participants valued Shareville session as an alternative to the perceived prevalence of didactic teaching methods in their curriculum. Some appreciated the opportunity for visual learning, and one student with dyslexia found this particularly useful.

> *"Instead of just reading off the board, or something, and telling us, it involved us and made me more aware. I felt like I learnt more than I would have if it was just a lecturer saying stuff.,"* Child/BSc/19/p5

The sense of exploration and discovery in a new environment, control, independent learning and the variation in learning objects all contributed to a sense of enjoyment. Students connected the sense of discovery in the virtual world with how they might experience this in the practice area:

> *"It was like if you were at work for the first time: you wouldn't necessarily know everywhere and you wouldn't even know certain instructions, you might have to find your way."* Adult/PgDip/13/p2

Many students, particularly those with little experience of learning disability found the discussions helpful in promoting understanding.

> *"The most valuable bit was probably actually seeing the video of the patients and then being able to discuss it with people around you afterwards, because you don't really get an option to do that when you're actually in practice, at the time, because you don't tend to talk about it till much later on."* Mental Health/PGDip/9/p4

Some participants mentioned a "fear of saying the wrong thing", suggesting that some preparation prior to the session would have improved their confidence in discussion:

> *"If we had been given some pre session work, like think about what you think of disability, then people will be able to come with ideas so that we could actually have a really good discussion about it, rather than having to sit there and sit on the spot, because lots of people don't like talking or feel a bit like, oh, what if I say the wrong thing kind of thing"*. Adult/Bsc/5/p4

A number felt that the response options to scenarios were overly simplistic or restrictive: they would have preferred to have identified their own solutions.

> *"It would have been good if it had more options so it actually made you have to think a bit deeper about what you're going to select."* Child/BSc/18/p1

Others thought that even when they chose a wrong option, this was useful for their learning:

> *"On the first one, I actually put the wrong option and then it was useful for me to see why it was the wrong option"*. Child/BSc/17/p4

Clinical practice

Many participants with no prior relevant experience felt able to relate their simulated experiences to their forthcoming clinical placements.

> *"Obviously seeing what you would see in practice or what you could come across in practice, that teaches you something – well, that teaches you a lot."* Mental Health/PgDip/3/p6

Shareville helped students to reflect on the decisions they would make in a particular situation and the consequences of these. This emerged as one of the strongest sub-themes.

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"Really, really useful because I was quite surprised at how much it made me think and I'd then question what I would do." Mental Health/PgDip/8/p2.

The enhanced sense of competence in some cases contributed to a reduction in anxiety.

"I feel a lot more confident now if I'm in setting when I go in placement in May that I'll know how to deal with it more. I think it would have been quite scary otherwise" Child/BSc/17/p5

A minority of participants, who had significant experience of working with people with learning disabilities, felt that Shareville had not fundamentally changed their approach, that the resource did not offer a representative view of people with learning disabilities, and that it was too simplistic for those with experience.

Fidelity

The fidelity of Shareville was compromised on two levels. Firstly, the child scenarios were acted by lecturers who were familiar to some students: one found this unsettling, though another liked the familiarity. The people with learning disabilities in the adult resource were played by actors. Secondly, participants commented on the fact that videos were overlaid onto a simulated background.

"It was a bit weird, I was a little bit confused because it's kind of real people are acting and then you've got a simulated background. I thought, … could you not put them in a room and then, I think it would just look better". Adult/Bsc/16/p2.

Students were generally able to distinguish these deficits in visual realism from the realism of the scenarios' content.

"I thought they were quite realistic and the way they were acted out gave you a really good insight." Mental Health/PgDip/ 12/p4

"It made us feel part of it, as if we were actually there, on our first day in the centre." Adult/PgDip/ 6/p2.

One student, with relevant clinical experience and a familiarity with serious gaming, felt that the quality of the resource and learning experience was low.

"I personally didn't find it particularly immersive at all. I essentially just saw it as looking at a screen, clicking on a video and making the decision. But the actual element of you being in the ward or in the care home and interacting with the patients, I didn't get any sense of that". Mental Health/PgDip/1/p2.

Immersion into the simulated scenarios was enhanced by the use of headphones: students reported that working individually and blocking out background noise enhanced the experience. Significantly, despite the limits to realism noted above, some students experienced emotional responses, for example to challenging behaviours.

"There was one particular man that is really crying and sort of hitting himself on the head and getting really upset, and I found that definitely affected me even though, like I say, I knew it wasn't real." Adult/PgDip/10/p3

Some students noted the opportunity to rehearse challenging situations and to process their own emotional responses:

"I think in fact more of that kind of thing might help, almost so people can test their reactions and things. All of those scenarios could be really challenging, depending on people's different backgrounds. But I think any, any sort of opportunity to practice that is really good." Adult/PgDip/6/p3.

Shareville as a pedagogy

The greatest disparity in student views concerned Shareville's pedagogical approach. Some variation in views about technical difficulties emerged, and lecturers' different facilitation styles. Some students found the lesson format helpful but others would have preferred to explore the resource independently and resented having to wait for others to catch up:

"I felt like it was just a bit fragmented maybe, like I was getting on to one thing [then] I had to sit and wait for everybody else to do that before I could go on and do the next thing." Adult/PgDip/ 7/p3.

Many of the students found that once they were engaged with Shareville they did not wish to be disturbed and wanted to work independently; others would have preferred to work together.

There were also different views about the use of discussion. Some found it helpful in making sense of the experience:

"I think it was useful for people to share those experiences because quite a few people in the class hadn't worked with people with learning difficulties before." Adult/PgDip 4/p4.

Others felt that they had not been given an opportunity to fully discuss the scenarios and how they could approach such situations in practice. Good discussion might depend on good facilitation:

"People didn't perhaps feel comfortable sharing because there wasn't a, I don't know, free and easy discussion going on. People weren't encouraged, I don't think". Mental Health/PGDip/8/p5

Teachers' interviews

Pre-Shareville interviews

Prior to the sessions, lecturers felt generally positive about using the resource, though some expressed anxiety about possible technical difficulties. An adult nursing lecturer thought the blended learning approach appropriate for adult nursing students.

Various concerns were raised however: for example, about the material's suitability for students on different programmes and for students having different levels of experience. Shareville also does not represent the ethnic diversity of East London.

One lecturer felt that virtual exposure to people with learning difficulties was preferable to a short clinical placement.

"If you give somebody a very brief exposure, what you are saying is oh come and have a look at some people with learning disability … Ethically, it feels quite clean to me". Adult lecturer/1/p1

But one learning disability specialist feared that scenarios depicting aggression and violence could strengthen negative stereotypes.

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Post-Shareville interviews

On the issue of students' prior experience or lack of it, lecturers were divided. One felt that for nursing students who had prior experience of learning disability,

> *"It cemented their experience and emphasised how useful it would be and leave you with transferable skills."*Adult lecturer/2/p4

However, another reported that.

> *"A couple of [PgDp mental health students] I spoke to just thought it was a bit ridiculous really"*. Mental Health lecturer/2/p1

Another adult lecturer felt that having experience actually helped the students engage more fully with the scenario as they had greater understanding of the issues.

One thought that for students without experience Shareville helped to draw together a lot of concepts that had only been theoretical up until that point such as "dignity, compassion, safety and clinical skills". One of the strongest themes was the value that lecturers placed on delivering blended learning in a class-room setting. The opportunity for students to explore feelings and ideas within group discussion was seen as vital. One thought it stimulated more thinking than a traditional didactic session.

> *"They were coming up with some really good stuff which I don't think they would have got from a normal teaching session with loads of PowerPoints."* Adult lecturer/3/p4.

One learning disabilities expert thought that students would benefit from thinking about to relate to a person with learning disabilities prior to actually doing it.

> *"You're encouraged to take a little time to think of what you're doing before you act, which is really important when you are in the field. Not just to barrel on in and do what you would do with someone who didn't have a learning disability"*. Learning Disability practitioner/1/ p3

There was congruence between data from lecturers and from students. Lecturers also valued the opportunity to learn from one another (adult, child and mental health nursing specialists and learning disability specialists).

Discussion

The generally positive evaluation of Shareville, and the reporting of outcomes such as improved confidence, knowledge and decision-making, reflects Connolly et al. (2012) review. Petit dit Dariel et al. (2013) identify that enhanced clinical reasoning is a particular feature of serious gaming, and this has clearly emerged in the findings of this study. There were inevitable discrepancies in students' preferences around the length and structure of the session (Blakely et al., 2009; Phillips et al., 2013).

There appeared to be differences between students who had experience of learning disability and those who did not: more data might demonstrate this more robustly. Some students noted limited fidelity. Ellaway et al. (2009) examines the concept of fidelity and reasons that resources with limited fidelity presentation can be equally immersive and contribute to learning by drawing on a strong narrative. The example of the man crying and head-banging may be an example of this. If Shareville is compared to resources with a stronger narrative such Stilwell and The Neighborhood, it could be seen to be lacking in terms of the fidelity of the characters themselves. The students engaging with the resource know very little about the characters other than their diagnosis and some clinical information. This is potentially perpetuating negative stereotypes of service users as the total of their diagnosis and behaviour rather than as complex individuals.

It is useful to consider Shareville within a theoretical context. Jeffries (2005) applied Chickering and Gamson (1987) seven pedagogical principles to using simulation in education in order to promote student satisfaction and learning. These will be considered in turn and how these were achieved during the design and implementation of Shareville.

Active Learning – Students learn best when engaged in activities that require active participation. Shareville requires students to engage with and direct their own inquiry in order to complete tasks and activities, and to join discussions.

Feedback – Students gain feedback in Shareville from the choices they make within the scenarios. The scenarios are accompanied by written comments regarding the situation and some explanation. Students also gained feedback through the group discussion process within the classroom.

Student-faculty interaction – Staff joined students in classroom discussions. Also, staff sought students' opinions in the early stages of the development of the project. Students could have been more closely involved in the design of the scenarios.

Collaborative learning – The students are encouraged to work together in groups to discuss the material and topic at various stages, and to draw together their learning into recommendations for their own future practice.

High Expectations – The staff facilitating the Shareville session, expected students to engage with and actively and participate fully with both the simulated reality and group discussion.

Diverse learning – Shareville has a number of different tasks that encourages learning in a number of different ways. This includes simulating experience, collation of factual knowledge, and then processing of the information through group processes. Using an online multi-media resource may appeal more to students who are visual learners. However it should be noted that the design of Shareville did not specifically consider the needs of students who have dyslexia or visual impairments that may have affected their ability to engage with the resource.

Time on Task – Through the process of delivering Shareville it became increasingly clear that students found it difficult to concentrate on screen based tasks for more than an hour. Clear signposts were given throughout the session as to how long would be spent on each activity allowing the students to maintain their focus. Inevitably, timings do not reflect the pace of work of all students equally.

Overall the design, delivery and context of Shareville has been demonstrated to have achieved all of the pedagogical principles of the model. Whilst the packaging, in terms of the graphics may have significant room for improvement the underlying scaffolding of the resource is pedagogically sound.

Limitations

There were a number of limitations in the design of the resource. A limited budget did not allow for professional actors to be employed, and a short project development time frame limited the time given to scripting the scenarios.

The evaluation sample was small (student n = 19 teachers n = 9), and participants were self-selecting, which may have led to bias in the findings. Students who did not participate may have been less satisfied. This study does not measure whether using Shareville actually results in any changes in knowledge, values and attitudes. The evaluation did include more post graduate students than undergraduate, which may have influenced findings.

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The thematic analysis was only undertaken by one of the authors and could have benefitted verification from an additional researcher.

Conclusions

Shareville's immersive scenarios with decision options in a facilitated blended learning session was valued by most students and staff. As a result, the University is currently exploring other ways of using serious games in the classroom. A new resource called CitySCaPE is currently being developed to replace Shareville incorporating the feedback and learning the researcher has gained from the implementation of Shareville. Enhanced quality videos are being developed that will allow students to be less distracted by low fidelity graphics. A more evolved narrative is being incorporated. The new resource is being developed in collaboration with actors who have learning disabilities and users and carers. The new resource will also incorporate a greater acknowledgement of the learning difficulties that students themselves may have and this is being taken into account in the design of the resource. CitySCaPE retains some of the interactive elements of Shareville which are seen to be vital in engaging students in this e-learning development. CitySCaPE's progress can be followed here, http://goo.gl/sdy4Gc.

Research questions that remain and may merit further exploration with the development of the new resource may present as:

- Do different facilitation styles lead to different outcomes?
- Does Shareville/CitySCaPE enhance knowledge, attitudes and practice?
- If so, are such enhancements time-limited or sustained?

Role of funding source statement

No funding was received in order to undertake the research or write this article.

Conflict of interest statement

There are no conflicts of interest in either the writing or research of this article.

Contributors & acknowledgements

LS adapted Shareville for local use, designed and contributed to the development of new scenarios, and developed materials and teaching plan for the facilitated sessions. EJB conceived and designed the evaluation study, and collected the data. LS analysed the data and formulated conclusions and discussion. EJB and LS drafted the article. SA provided expertise in the final drafting of the article.

Shareville was developed at Birmingham City University (BCU) and aspects of it were licenced to and adapted for City University London. Additional scenarios were developed at City University London (CUL) and imported by BCU. We would therefore like to thank the developers at Birmingham City University, and the educational technologists in our school and in the CUL Learning Development Unit who helped to develop Shareville for use at City. The scenarios would not have been possible without the participation of the children involved and we would like to acknowledge the importance of their contribution. We also gratefully acknowledge all the staff and students at City University London who took part in the research.

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