Health literacy practices of adults in an avatar-based immersive social virtual world: A sociocultural perspective of new media health literacies

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Introduction

The continued development of avatar-based immersive technology such as 3D social virtual worlds (VWs), games and virtual reality – that can be used to provide ‘places’ where communities can create and socially interact with health information through simulation, games, peer support groups and with healthcare practitioners via the virtual self – require a new perspective on new media health literacy.

This chapter discusses how new media children and adolescents’ social skills and cultural competencies were reflected and adapted in the context of adults and health, through findings from a qualitative interview based study carried out in a 3D social VW with 25 adults aged 18-70 across 10 countries. The study was carried out during September 2011 to June 2012.

3D social virtual worlds

3D social VWs are online multi-user virtual environments (MUVEs) that people can globally access using an avatar as the virtual self. Avatars can be modified to represent humanoid, fantastical, animal or anthropomorphic beings.

The avatar can also be animated to show facial expressions or movements to enhance non-verbal communication and can ‘chat’ to, and interact with, other avatars, the environment and objects in the VW. Communication with other avatars is initiated via either private instant messaging (IM) or with other avatars near them (not private, but can only be seen/accessed by avatars in close proximity to each other), or collectively across a group of users of the VW (not private, seen/accessed by all avatars in the group), using text or voice (Wagner, 2008). However, importantly the avatar in these worlds is driven by a human, and not artificial intelligence. Therefore, in VWs the avatar represents the person driving it from the physical world (PW). In this chapter the use of the term ‘real world’
is not used as this may infer that the experiences, relationships or learning in the VW have no bearing or influence on behaviour in the PW. The interactive, visual and auditory nature of VWs that react to the users’ movements (objects are closer as the avatar walks closer, noises increase or decrease) creates a psychological state of immersion, presence (being there) and social presence (being there interacting with others) (Witmer and Singer, 1998; Biocca et al, 2003; Schultze, 2014), which differentiates it from other areas of the social web.

Health literacy, the ability to search for, appraise, understand and use health information and social resources to make health decision, is important to people’s ability to maintain health or self-manage a health condition (Nutbeam, 1998; Dodson et al, 2014). Health literacy is considered a modifiable social determinant of health that can be improved or strengthened through interventions (WHO, 2017). However, models or measurements of health literacy often focus on individual skills or capabilities and ignore the social resources that are important to individuals and communities’ collective knowledge and skills that can promote a distributed model of health literacy (Edwards et al, 2015). When these communities are online, in emerging new media and social areas of the web, information, skills, knowledge and sense-making can collectively contribute to improvements in health literacy through a network and sociocultural model of health literacy (McElhinney et al, 2018).

**New media literacies**

Previous studies of new media literacies (New London Group, 1996; Gee, 2010a; Lankshear and Knobel, 2011) and the new media informal learning practices of children and adolescents have discovered the multiple social skills and cultural competencies (multiliteracies) that are required to learn to become literate in the 21st century (Jenkins et al, 2006, 2009). The highly cited White Paper (Jenkins et al, 2006) and the report, *Confronting the challenges of participatory culture: Media education for the 21st century* (Jenkins et al, 2009), argued that children and young people require specific social skills and cultural competencies for 21st-century learning and literacy (see Chapter 18, this volume). This report set out the multiple literacies that moved literacy beyond reading, writing and numeracy. These were discovered through numerous reviews of new media literacies studies and the new media informal learning practices of children and adolescents, and included characteristics related to performance, play, simulation, negotiation, networking, multitasking, distributed cognition, collective intelligence, appropriation, judgement and transmedia navigation.

In the study discussed in this chapter, it is argued that many of the social skills and literacy practices enacted by adults, for example, mentoring, negotiating, networking, playfulness, judgement, problem-solving, collective intelligence and sharing resources, are similar to the literacy practices of children and young people found by Jenkins et al (2006, 2009) and other researchers of avatar-based 3D online games and VWs (Gee, 2003; Black and Steinkuehler, 2009; Elliot,
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In quantitative and qualitative ethnographic studies, researchers in 3D avatar-based massively multiplayer online games (MMOGs) (Steinkuehler, 2008) and 3D VWs (Barab et al, 2007; Gillen, 2009; Marcon, 2013; Merchant, 2013; Pellicone and Ahn, 2015) found several social skills, cultural competencies and literacy practices were being used by children and young people.

This chapter discusses how these new media health literacy practices influenced individual and community health literacy and health behaviour change in the PW. The socially constructed mechanisms discussed in the findings maximised the health literacy resources available, meaning improvements to individual or group health literacy was not only reliant on individuals’ skills, but also on the health literacy practices of their social connections. Therefore, the use of others within participants’ social networks as proxies, mediators or mentors who shared knowledge, information and skills with each other, to access resources and learn new ways to improve health literacy, reflects a social approach to health literacy discussed by (Papen, 2009; Chinn, 2011; Edwards et al, 2015; Rowlands et al, 2016). This also represents a sociocultural approach to literacy discussed by experts in new literacy studies and new media literacy studies, where literacy is seen as a situated social practice and a community resource realised in social relationships, and is shaped by cultural and social constructs (Barton et al, 2000; Gee 2010b; Mills, 2010; Street, 2014; see also Chapter 36, this volume). Hence understanding these multiliteracies in adults makes a unique contribution to enhancing understanding of the literacies required across the lifespan in modern online social environments, particularly those that are avatar-based.

Equally important is the unique contribution this study’s findings make to understanding the importance of the avatar as the virtual self, the immersive VW environment and other people, to how VWs can be used to increase attraction to, and engagement with, health information to increase health literacy. Findings show evidence of concepts of Bandura’s social cognitive theory (1998), such as mastery, which he regarded as the most powerful to influence self-efficacy and vicarious experiences, which relates to the involvement of social models to influence self-efficacy. Bandura argued ‘seeing people similar to oneself succeed by sustained effort raises observers’ beliefs that they too possess capabilities to succeed’ (Bandura, 1998, p 626). However, in this study it was the use of an avatar as the virtual self to master or experience behaviour as opposed to others that influenced behaviour change. There was also evidence of the Proteus effect (based on Bem’s 1972 theory of self-perception) discussed by Yee et al (2009), where the appearance and behaviour of the avatar influenced behaviour in the PW. Additionally, through 3D simulation and discussion perspective-taking theory was evident (walking in others’ shoes) (Selman, 1975; Gehlbach et al, 2015). These findings are similar to, and supported by, several researchers of VWs and other immersive environments (virtual reality) who have reported evidence of positive changes to participants’ behaviour, attitude and empathy to others. Examples include interacting as a person with a disability (Ortiz, 2009), dementia (Wijma et al, 2017), through simulated virtual hallucinations (Yellowlees and Cook, 2006)
or by taking on a different gender (Yee and Bailenson, 2006) or race (Groom et al, 2009; Gutierrez et al, 2014).

**Overview of the study**

The study received ethical approval from Glasgow Caledonian University School of Health and Life Sciences (A11/001) and was undertaken in the social VW Second Life®; all participants were recruited in the VW and with consent, and interviews were undertaken via the VW private IM function, with interviews taking place in a private area of the VW. The ethical considerations involved in the study, recruitment methods and data collection methods have been reported in more detail (see McElhinney et al, 2014). Interviews and field notes were analysed following the principles of thematic analysis (Braun and Clarke, 2006).

**Findings**

Themes from the analysis of the data included those that were related to the study context and environment and are discussed in the thesis (McElhinney, 2015). For the purposes of this chapter themes related specifically to health literacy practices and behaviour change are discussed.

**Theme: Accessing health information in the VW**

This theme discusses and describes how accessing health information and healthcare practitioners in the VW was achieved through individual and social methods, and how the affordances of the VW influenced participants’ ability to make sense of and use health information to decide to change their behaviour in the PW. Particularly important to those who had health conditions or low disposable income that prevented them from attending local health meetings or events in the PW was the instant access of the environment. The psychological feeling of VW presence (being there) and social presence (being there, interacting with others) was reported as different to other online forums:

[Researcher: ‘So do you think the avatar and the environment is important?’] ‘Yeah to have avatars, in world experiments, and lectures which I couldn’t otherwise attend, well, it’s cool. It’s the wow factor that also keeps me coming back…. Yeah, I think it saves gas, has the cutting edge and latest info, and it presents it at times I can attend. For example, some lectures here would be in another state or even country which I can’t attend that way. Virtual means there’s no transportation limitations. So basically, I save money and I spend less time traveling and more time recuperating.’ (Avatar 23, male, aged 41-50)
Interestingly the immersive environment was also important to generating a feeling of an informal egalitarian environment; this was particularly important when the subject was difficult or emotional:

‘I’m also less shy and reserved on this than in person. It’s easier to ask questions. In real life I’m a bit more shy and reserved and I get a little nervous and forget what I wanted to ask.’ (Avatar 23, male, aged 41-50)

However, navigating health information was difficult using the search function. This was further complicated using different software to access the VW (known as a viewer):

‘The SL [Second Life] search is notoriously poor, so sometimes your search has to be pretty general to catch what you want.’ [Researcher: ‘When you do search, how confident are you about searching for health information in the virtual world? As in, you will find what you are looking for?’] ‘About finding a result?’ [Researcher: ‘Yes.’] ‘Not that confident, like I said, SL search is pretty poor.’ (Avatar 6, female, aged 51-60)

Due to the challenges of search, participants used other strategies to find VW health information such as joining groups and communities. This led to group connections and, if desired, individual friendships. Communicating with groups could be achieved via group chat online at the time of posting, via notices of events created by the owner of the group received by members while in-world or via email when ‘logged out’. The decision to pass this information on was often decided with others, therefore reflecting a social appraisal and judgement regarding the trustworthiness of the information and whether to share it. This network approach to searching increased the health resources of individuals and groups:

‘If you have friends in here a social network that you start asking about something, someone has a friend, who has had a friend that has found something that they had a lot of benefit from a particular program or found a particular island.’ [Researcher: ‘So was it like a recommendation?’] ‘Yes, very much so for lots of things in Second Life, but especially with healthcare.’ (Avatar 14, male, aged 51-60)

‘The big kicker is mingling with people and getting invited to join groups. Then in the group chat people announce other groups and that’s more resources. Works better than just searching, it’s networking like if I was looking for work but I’m looking for info and even help.’ (Avatar 23, male, aged 41-50)
These unique in-world communication and information-sharing strategies were used to distribute information between infinite amounts of connected, interconnected or random people allowing information to be distributed to friends while ‘online’ or ‘offline’ via IM sent to email or even by leaving a ‘box of information’ in the VW that could be clicked by other avatars to deliver the information to their inventory (where they could access it later). Although some of these in-world strategies are similar to how information can be shared in web participatory social media, it was often the feeling of synchronously connecting with an avatar and places as opposed to ‘flat’ text that was seen as different and more intimate:

‘The thing that is different is that on the web you are alone, even if there is a chat room, you know, even, because things are asynchronous … and because it is flat … so you don’t have the sense of being “in” the environment.’ [Researcher: ‘Right, so?’] ‘I am a very big reader but I think, yeah, virtual worlds offer a higher level of immersion that is important to our wellbeing.’ (Avatar 4, female, aged 61-70)

The difference from Web 1.0 was the ability to experience information synchronously with others. Participants referred to ‘journeying’, ‘stumbling upon’ or ‘walking through’ the information with friends, a significant other or health groups, and this increased understanding and recall of the information. This was specifically relevant when one person had a health condition as they reported that this had helped their friends, family or partner understand their condition better through experience and discussion:

‘I brought a loved one to the PTSD [post-traumatic stress disorder] simulation and I usually go to presentations with the same loved one we discuss the information a LOT.’ (Avatar 18, female, aged 41-50)

‘I can also explore interactive exhibits and network with people such as Survivors of TBI [traumatic brain injury] group and the Virtual Ability one…. I’ve got friends and they mostly know I’ve got a TBI and some even go to these events with me.’ (Avatar 23, male, aged 41-50)

Interestingly, social connections and gatherings were discussed as they would be in face-to-face PW meetings, ‘bumping into people’ or ‘sitting talking’. However, the ability to teleport to a health event or piece of health information and synchronously experience it, discuss it or walk through it together differentiates it from web sites, other participatory social media and indeed, the PW.

**Theme: Understanding health information**

This theme discusses the way in which participants made sense of information and how this influenced their understanding in the VW. The VW presentation
style of information, through notecards of text, slideshows, 3D representations of anatomy, interactive simulations and healthcare practitioner seminars influenced understanding and recall. A number of key health literacy VW skills and practices were evident in the participants’ appraisal of the information such as discussion with others, asking questions, navigating and judgement of trustworthiness, comparing information and social skills.

Healthcare seminars from practitioners or researchers were particularly popular as they allowed access to talks that participants believed they could not access in other media or in the PW. The ability to ask questions and discuss the subject with practitioners and others at the time of the talk was seen to aid understanding by increasing or sharing knowledge, clarifying information and affirmation.

Some of the key features afforded by 3D VWs are the feeling of being in a place that allows the avatar to walk around or interact through objects. Interactive, multimodal (visual, audio) objects and simulated scenarios were reported as interesting, attractive and engaging, which helped to increase knowledge and understanding:

‘The most powerful one that I have ever been to was that exhibit on schizophrenia, it was, ummm, disturbing because it was so real and so visceral and others on stomach cancer and eye cancers, umm, they were very visual and very good, a combination of notecards you could pick up, signage you could read um, and, eh, pictures that you could see. The thing for me that is so powerful is going through an exhibit like that with someone else in real time, rather than by myself, in which case the web would do a fine job.’ (Avatar 14, male, aged 51-60)

‘Several of them were interactive and that, if it’s a really good interaction … we had a great time at the nutrition simulation at Idaho.’ [Researcher: ‘Mhmm.’] ‘I don’t know if you have seen the blizzard disaster and emergency preparedness simulation. That is another great one. You get totally involved and totally immersed in it. Um, those were both really great. Same thing with the nursing simulation at the University of [name removed] I watched while [name removed] went through the process of reviving the baby [both laugh] – you learn better when you are engaged.’ (Avatar 11, female, aged 51-60)

Participants reported several helpful factors that aided understanding: anonymous avatars, the environment, access to healthcare practitioners and discussion with others. Discussion led participants to multitask, searching and comparing information in other areas of the web, to increase depth, compare or share information:

‘Discussion does help as it allows you to consider different perspectives and ask questions specific to the situation that drove you to go looking
in the first place. This often enhances the search process as well as expanding your horizons from the narrow starting point. It can also help keep one focused as the direct feedback and interaction provide strong impetus.’ (Avatar 17, female, aged 51-60)

[Researcher: ‘Okay, so when you were talking to the healthcare practitioners, did you find that a good way to get information?’] ‘Yes, definitely at the end of each talk that the healthcare professionals do, I … at the events, everyone will always say are there any questions, so this gives access to someone who normally I probably wouldn’t be able get to and ask any question you want to. It’s much better than you get in real life, you’d have to go a long way in real life to be able to do the same.’ (Avatar 16, male, aged 31-40)

Regarding trustworthiness, participants referred to several methods to check the credibility of the avatar delivering the information, the ‘place’ in which it was delivered or the content of the information. This included multitasking through various sources, asking VW ‘friends’ or groups, and checking the credibility of the avatar by searching profiles or ‘Googling’ the avatar ‘real name’ when available.

When specifically discussing the identity of healthcare practitioners, participants were asked if the appearance or name of the avatar mattered to their ability to trust the VW practitioner or the information provided. There was no consensus, although for some names an appearance were important:

‘I would like to say no, but yeah, it does and so does the name. Don’t call yourself “silly little booboo” and claim to be a psychiatrist [both laugh] because I think you need to get on your own couch next then, and I am all for fantasy and being who you want to be in Second Life but if you want to be professional you need to kind of look it, and be it, and have an alt [alternative avatar] – who cares, it doesn’t instil confidence if you have an idiot name.’ (Avatar 11, female, aged 51-60)

‘now that I think about it, I think yes, it does matter if they have a goofy looking avatar, then I think I would start to question their intent or their information I’m not sure why. Prejudice I guess, lol, no seriously, I have tacit expectations of professionalism in Real Life which carry over here into SL they don’t have to be all buttoned up in a suit but there is what I would consider to be unprofessional appearance. I never really thought about this before!’ (Avatar 18, female, aged 41-50)

For others the focus was instead placed on behaviour or content of information provided:
‘Ohhh, that is a fantastic question but, eh, for me, no, not at all, they could be a flying toaster oven, they could be a Dragon, … I find it ridiculous that the appearance in SL is linked to the qualification…. So I find this throwing away of these norms, of these naming norms, and the appearance and the likes very refreshing. Going back to the white coat Dr syndrome,… if someone appears with the white coat in SL then, mmmm, maybe they would be better as a toaster oven [both laugh].’ (Avatar 25, male, aged 41-50)

**Theme: Changing behaviour, taking action**

When participants discussed changes to health behaviour they referred to bi-directional behaviour changes (that is, changes in both worlds) as well as changes to PW health behaviour only. The bi-directional changes included: changes to attitudes, reduced stress and anxiety, improvement in social skills and increased confidence or positive influence on self-management of long-term conditions. PW changes included: health lifestyle changes such as losing weight, stopping smoking, changing diet and increasing exercise.

Changes in attitude were particularly evident in non-disabled participants who reported changing their attitude to people with disabilities after interacting with simulations or people with disabilities in the VW. This was exemplified in the VW by the ability to ‘walk in others’ shoes’, with non-disabled participants being able to experience symptoms of a specific condition or disability:

‘Em … the interaction I have received from Second Life … with disabled people, has made me look at disabled people in a new light in the real world. I think before I used to look on disabled people as people who need help, now I see them as just the same as me but disabled … when I got to Second Life I started to meet the people who were disabled and that made me want to find out all about them.’ (Avatar 16, male aged 18-30)

‘They had a rather compelling autism experience and they told you how to set your camera and your sounds and all and it was a cacophony of sounds and motion and things we felt like we were spinning round, I said to [name removed]…. I had to get out, which was a really good lesson on what people with autism faced.’ (Avatar 11, female, aged 51-60)

What emerged from many participants’ accounts was a feeling that after a period of social interaction in the VW, VW and PW self-efficacy and self-confidence increased and social skills improved. This was particularly evident in participants who had social anxiety or social isolation, an existing health condition or a disability. This increase in self-efficacy, confidence and improved social skills was
often attributed to the ability to ‘rehearse’ or ‘master’ behaviour in the VW via
the avatar before attempting it in the PW:

‘I have mental health issues, major depression … etc. I have very little income so I have very little social activity so I came to SL, it was more for the social aspect but it is helping me work on some of my … stuff…. I consider my avi to be my inner self, and as she gains confidence, so do I and I have felt the difference in myself, it is good…. I notice a change in just the way I walk down the hall, the way I stand it feels good, and more confident…. I try to build on that a little, I am beginning to recognise possible triggers. I recognise more how much my anxiety is caused by my frustration with my difficulties.’ (Avatar 7, female, aged 51–60)

‘My social skills for sure improved, communicating and how to act around people improved drastically. I am aware that it is nowhere near “normal”, but at least it’s huge leaps ahead from what it was. I can also do more unplanned things now, which often is a problem for people with autism. So yeah, VW can be a great tool used properly in the right environment.’ (Avatar 20, male, aged 18–30)

Eight participants who had sought out or ‘stumbled upon’ information or simulations that were aimed at modifiable lifestyle behaviour change used this information to take action and change their behaviour in the PW. Watching their avatar’s shape change automatically or by manipulating their avatar to appear slimmer in the VW in response to the level of exercise or due to food choices inspired some participants to modify their behaviour in the PW, again, reflecting Bandura’s (1998) previously discussed mastery and vicarious experiences concepts:

‘Yeah, it did, I will take the nutrition information into the real world … the nutrition one has changed how I look at food, what shall I eat [laughs] or is it just what I wanna eat [laughs] … when we took a break later for dinner, ha, we came back and [name removed] says well I…. changed my mind about what I was having for dinner because we learned so much [laughs] and that is the point!’ (Avatar 11, female, aged 51–60)

For others it was the availability of healthcare practitioners and the VW environment that led to greater trust in VW practitioners than those in the PW, reflecting positive reinforcement:

‘I met, very early on a woman at the University of [name removed] that was running a project that has to do with weight loss and the health benefits of weight loss, and I got very interested in what she
was doing because I had just started to lose weight.’ [Researcher: ‘Mmm, right….’] ‘… and I … found a lot of positive reinforcement because they knew what they were talking about…. So, I’ll give you the really best example is that except for days like today when it is pouring out, I walk 40 minutes a day now and I thank among other people the woman in the University of [name removed] who I met in here for helping me with that. For the reinforcement that allows me to do that now. I have lost 30 pounds and I credit SL for a lot of that.’ (Avatar 4, female, aged 61–70, suffering from rheumatoid arthritis)

‘I spent ages soaking it all up, and then decided to have a complete lifestyle overhaul, in fact checked out what I was doing against what I should be doing.’ [Researcher: ‘So, did it help to motivate you, do you think?] ‘Yeah stopped smoking after 35 years, 14 months ago I stopped completely never had another since. Lost weight, I was amazed!’ [Researcher: ‘Excellent and you think the information helped?] ‘It was the ageing sim that did it; also I looked further into some of the advice. I was ripe for change, I was in the mood for change, the ageing sim laid it all out for me and let me look as long as I wanted to all I had to do was change.’ (Avatar 8, female, aged 51–60, suffering from high cholesterol)

**Discussion and challenges**

These findings are important to our understanding of what people do and want from the social web in the context of health. They also reflect many of the concepts within Nutbeam’s (2000) interactive and critical levels of health literacy. They add to our understanding of the expectations of adults who use immersive avatar-based virtual environments, particularly with reference to design principles that promote attraction and engagement with health information that can influence health literacy and behaviour change. However, it remains a challenge for healthcare practitioners to design information in these areas that requires multiple skills and a time commitment. Additionally, these platforms are often inappropriately labelled as games. However, the social skills and competencies (multiliteracies) discovered in this study differ from the health literacy skills and practices required for accessing other areas of the web, particularly Web 1.0, where people passively access static web pages and information is accessed with no or little interaction. The health literacy practices are more akin to social Web 2.0 tools that facilitate collaboration and are found to be popular for seeking health information and affirmation (Fox, 2011; Higgins et al, 2011; TNS Political & Social, European Commission, 2014). However, uniquely, they add an understanding of the psychological importance of avatars as the virtual self and an environment that is immersive, with multiple auditory and visual communication tools and interactive objects.
Conclusion

This chapter has evidenced the multiple social skills, competencies and social resources that influence health literacy in the context of adult social avatar-based immersive environments. Importantly, the social skills and literacy competencies in this study did not need to be achieved by all participants, allowing distribution of knowledge and skills throughout networks supporting the concept of a ‘network’ approach to improving individual and community health literacy. Additionally, this is the first study to explore the multiliteracies used by adults in these emerging areas of new media, and show the similarities to those used by children and adolescents promoting a move away from compartmentalisation of age groups to a more intergenerational lifespan approach to new media literacies. Thus, placing people with different levels of health literacy in intergenerational groups, or people who are socially isolated in VW communities, other online networks, or offline communities who have different social and cultural literacy competencies may help improve individual and community health literacy. The importance of understanding these multiple literacies requires a change in how healthcare practitioners, researchers and policy-makers review the design of health information that is accessed or presented in avatar-based social environments or other areas of the social web, and moves the focus of literacy as an individual process to a situated sociocultural model of health literacy.

References


Gee, J.P. (2010b) New digital media and learning as an emerging area and ‘worked examples’ as one way forward, Cambridge, MA: MIT Press.


