DIGITAL NATIVE IDENTITY DEVELOPMENT IN VIRTUAL WORLDS

Research in Progress

McKenna, Brad, University of East Anglia, United Kingdom, b.mckenna@uea.ac.nz

Vodanovich, Shahper, Auckland University of Technology, New Zealand, shahper.vodanovich@aut.ac.nz

Abstract

In the transition from childhood to adolescence, teens are engaged in defining who they are and finding a place in the wide world creates insecurity. Digital natives are growing up as part of digital generation where technology is ubiquitous in a young person's life. One online technology commonly used by digital natives are virtual worlds. Increasingly, they have come to rely on this digital media to help them navigate the challenges and issues they face in this period of life. This paper presents a research framework designed to provide a road map for the IS community in conducting research into this new and exciting area of virtual worlds and their impact on digital native identity development.

Keywords: digital natives, identity, virtual worlds

1 Introduction

In the transition from childhood to adolescence, teens are engaged in defining who they are and finding a place in the wide world creates insecurity. According to Ryan (2001), the importance of belonging to a peer group is especially pronounced in intermediate or high school, when the digital natives' school is likely to be bigger than in was in primary school and the student body much larger and more diverse. These changes can be threatening to digital natives' developing identities. Digital Natives must negotiate their identity and structure their new social world in this new context. Labelling self and others as belonging to one or another group lends structure to social interactions and boosts identity formation (Eckert, 1989).

Virtual worlds enable millions of digital natives to interact with one another through avatars in online three-dimensional worlds. These worlds are often constructed to look much like the real world and can contain mountains, trees, oceans, and wild creatures (Castronova, 2007). As an increasing number of Digital natives start to use virtual environments, they need to be studied as an important phenomena in their own right (Castronova, 2005a, 2005b). Digital natives are growing up as part of digital generation where technology is ubiquitous in a young person's life (Lenhart & Madden, 2005; Marc Prensky, 2001a, 2001b; Don. Tapscott, 1996; Don Tapscott, 1997). Increasingly, they have come to rely on this digital media to help them navigate the challenges and issues they face in this period of life (Lenhart & Madden, 2005; P. McKenna, 2007; Nielsen & Loranger, 2006). Adolescents growing up in the present time have variously been classed as the Net Generation, Generation Z, Millennials and Digital Natives (Palfrey, Gasser, Maclay, & Gerrit, 2011; M. Prensky, 2004). While the term "Digital Native" has come under fire in recent times (Bennett, Maton, & Kervin, 2008; Teo, 2013), we use this term in this research to represent adolescents between the ages of 12 and 17 who have grown up in digital world.

Information Systems (IS) researchers have long been investigating the relationships between technology and people. Recently virtual worlds have further changed the way organizations and social groups organize. Schultze and Rennecker (2007), argue that virtual world games have changed the way organizations communicate and conduct business, and are a legitimate arena for conducting IS research (Schultze & Rennecker, 2007). Schultze and Orlikowski (2010) argue for the value in virtual worlds enabling globally distributed work, project management, online learning, and real-time simulations (Schultze & Orlikowski, 2010). Virtual world games also offer new and promising opportunities for IS research into virtual organisations and teams (Assmann et al., 2010; Schultze & Orlikowski, 2010; Schultze & Rennecker, 2007), as well as, we believe, identity development. Virtual worlds such as Second Life and World of Warcraft have implications for business, education, social sciences, and society as a whole (Messinger et al., 2009). However, there is much that is yet to be understood on how virtual worlds impact organisations and society (McKenna, Gardner, & Myers, 2011), and in particular Digital natives and their personal development (Vodanovich, Shen, & Sundaram, 2015; Vodanovich, Sundaram, & Myers, 2010).

One of the key developmental tasks faced by adolescents is developing a coherent sense of personal identity, answering questions like "Who am I?", "Where do I come from?" The rapid changes occurring in cognitive development, verbal skills as well as physical changes to the body all contribute to the development of a stable and coherent identity (Meeus, 1996, 2011). During adolescence, world views become important and they enter what is called a "psychosocial moratorium" where adolescents freely experiment with various possible adult roles in order to find one that seems to provide a unique fit (Erikson, 1980). If adolescents are unable to develop a coherent identity, they may fall into role confusion.

Previous research has claimed that social phenomena in the virtual world can be used as a proxy to studying social phenomena in the real world. However, virtual worlds have some important characteristics which make them quite different to the real world (McKenna, Gardner, & Myers, 2011).

One aspect that can be considered in the context of the impact that virtual worlds may have, is on the development of self-identity which can be seen as one of the key developmental milestones in the adolescence period (Erikson, 1980; Vodanovich, Shen, & Sundaram, 2015). Virtual worlds may allow adolescents to "try on" different personas and determine which persona will gain the most approval and acceptance (McKenna & Bargh, 1999). Self-reflection and identity formation can be enhanced by emotional and intellectual openness which Digital natives find in the virtual environment as they find it easier to expose their inner thoughts and personal information online. Adolescents are increasingly embracing the virtual world as a means to explore their identity in creative and new ways, asserting their sense of self in a highly personal form, customising their sites with unique photos, text, tags and avatars (Cheng, Farnham, & Stone, 2002). Therefore, further understanding of how virtual world technologies, avatars, and the unique nature of virtual worlds impacts social phenomena is in need of attention from the IS community (McKenna, Gardner, & Myers, 2011). To address these issues, this paper presents a research framework designed to provide a roadmap for the IS community in conducting research into this new and exciting area of virtual worlds and their impact on Digital native identity development.

We need more understanding about the progression of identity development in a virtual world environment for young people. In particular, (Blodgett, 2009) emphasizes that greater synthesis is needed between Digital natives, game research, and computer-mediated communication as there is no clear understanding of what the technology means Especially in terms of identity development.

In particular, the research objective of this paper is to propose a research framework that will enable us to understand which aspects of Virtual Worlds can amplify or attenuate positive identity development for Digital natives.

2   Virtual Worlds

A virtual world can be defined as "*a synchronous, persistent network of people, represented by avatars, facilitated by networked computers*" (Bell, 2008) (p.2). Virtual worlds include social virtual worlds such as Second Life (SL), and gaming virtual worlds, often referred to as Massively Multiplayer Online Games (MMOG), such as World of Warcraft (WoW).

Virtual worlds have been used to study and simulate activities in the real world. Virtual worlds have the potential to be used by political and social scientists to observe individual and patterns of online behaviour in order to test social theories or develop new ones which could then later be applied to the physical world (Papargyris & Poulymenakou, 2008). Researchers have examined criminal or disruptive behaviour in virtual worlds such as money laundering (Elliott & Kruck, 2008) or griefing (Chesney, Coyne, Logan, & Madden, 2009). Jung & Kang (2009) investigated users' purposes for using social virtual worlds and found that some people use them to escape from the real world and to satisfy their social and hedonic needs (Jung & Kang, 2009). Klastrup & Tosca (2009) explored clothing and fashion inside virtual worlds as a form of identity. They found that players notice what other players avatars are wearing and that fashion in the game world is a vehicle for individualization and a way of personal storytelling (Klastrup & Tosca, 2009).

Virtual worlds also have the potential to become laboratories where experiments in social science can test new norms, values, and institutions before they can be applied to the physical world (Bainbridge, 2010a). Virtual worlds have the potential to be proving grounds for real world social innovations, cultures, and social movements (Bainbridge, 2009) as well as substituting for social institutions in the real world (Williams, 2006), for example allowing groups of geographically dispersed people to meet each other (via their avatars). The unique nature of virtual worlds means that users and researchers of these worlds must be prepared to adapt to them and the social conventions and rules within. Kozinets and Kedzior (2009) developed three characteristics of virtual worlds, re-worlding, re-embodiment, and multiperspectivality. These characteristics have also been applied to a virtual world framework in

(McKenna, Gardner, & Myers, 2011). These characteristics, which form the basis of our research model, will be discussed in the next section.

2.1   Re-Worlding

As described in (McKenna, Gardner, & Myers, 2011), re-worlding relates to how a virtual world is experienced. It has a related concept of plastic worldrules which implies that the rules in virtual worlds are flexible. In fact, some virtual worlds enable the user to have complete control over the virtual space, and therefore may become an extension of a person's identity. Schultze and Rennecker (2007) developed a classification scheme that characterizes virtual worlds between progressive or emergence rule structures and their degree of correspondence to reality or fantasy. This has consequences for the interpretation of reality inside virtual worlds. Each virtual world is different to the next. Some virtual worlds contain radical alterations of real-world physics, for example enabling avatars to fly or teleport, while others allow users to modify the environment around them such as deciding the time of day or altering weather conditions. Providing the user the ability to alter and shape their surroundings extends the identity of the avatar far beyond the body. Therefore virtual places can become representations of the virtual identity of users (Kozinets & Kedzior, 2009). As digital natives embrace virtual spaces, they are likely to experience multiple realities (virtual and physical), which we believe may have some influence on identity development, both individually and collectively.

2.2   Re-Embodiment

Re-embodiment is where the user is required to select a new bodily form to represent him or herself in the virtual world (Kozinets & Kedzior, 2009). McKenna et al. (2011) illustrated that users of virtual worlds must create an avatar which usually requires choosing its gender, race, appearance, and skills. The creation of an avatar is extremely important since the identity they create will affect how there are perceived by others (El Kamel, 2009). Youth are often concerned about how they are perceived by others, so we believe this would also carry onto the way digital natives design their avatars. Often, a virtual identity may be a more realistic representation of a user than the physical identity they use in their day to day life. Therefore, a question begs, is a digital native more likely to create an avatar which is recognised by their peers, or an avatar which is more likely to represent their true self? There have been a number of studies which have examined virtual world identities including Bainbridge (2010b), Boellstorff (2008), Hagström (2008), Nardi (2010), and Tronstad (2008).

For IS researchers, this means that, if they are going to do some kind of online fieldwork in virtual worlds, they must choose an avatar. The avatar they choose who will affect the way they are perceived by other users. Therefore, when studying digital natives online, the researcher needs to consider choosing an avatar which resembles that which youth can identify with, or one which clearly identifies themselves as a researcher. Clearly, knowledge is required of the virtual world cultures and norms in question before embarking upon the research (Kozinets & Kedzior, 2009). In WoW, for example, players are required to create a name, which is then displayed above the avatar's head and is how the avatar (and user/researcher) will be identified by others (Hagström, 2008). The appearance of an avatar also has an impact on the capabilities of that avatar within the virtual world. For example a wizard avatar has magical abilities while a monster avatar may have hunting abilities in game (Tronstad, 2008). Therefore we believe that digital natives must consider their virtual identity carefully before entering a virtual world community (Kozinets & Kedzior, 2009).

2.3   Multiperspectivality

McKenna et al. (2011) further explains that users or researchers have the option of occupying more than one virtual world simultaneously (Fornäs, Klein, Landendorf, Sundén, & Sveningsson, 2002;

Moore, Gathman, & Ducheneaut, 2009) and can have multiple online bodies (Bainbridge, 2010b; McKenna, Gardner, & Myers, 2010). The concept of multiperspectivality, or multiple perspectives and multiple bodies is also quite unique to researchers, but possibly not to digital natives. Digital natives may create multiple characters within a game, which sometimes may represent different identities. Some users maintain just one avatar, while others have multiple avatars (Christopher, 2009). For example, McKenna et al. (2010) used two characters to understand player experiences in WoW, Bainbridge (2010b) used twenty-two characters, while Nardi (2010) used just one. This unique concept of multiple bodies, which digital natives may use, creates a challenge for researchers.

Gender swapping (Boellstorff, 2008) is another expression of multiperspectivality, and may be also an important element of digital native identity development, for example a transgendered youth may be able to experience life as the opposite gender firstly in the virtual world, before taking their new identity into the physical world. This has the potential to provide an opportunity to learn about virtual world experiences of the opposite sex (Kozinets & Kedzior, 2009) or gender stereotypes in a virtual world (Bainbridge, 2010b; Taylor, 2006). McKenna et al. (2011) applied these three virtual world characteristics of re-worlding, re-embodiment, and multiperspectivality to a research framework for the study of social movements in virtual worlds. In this paper, these three characteristics will be applied to digital native identity development within virtual worlds, which will be further developed in the proceeding sections of this paper.

3   Identity

The ability to express oneself through self-disclosure is crucial to identity formation. Digital natives employ text and images in their profiles and blogs to describe who they are, what they like, and what they do. These features of social networking sites allow users to reveal information about themselves and their lives (Jones, Millermaier, Goya-Martinez, & Schuler, 2008). Adolescents may find the struggle with self-presentation a difficult one. At this stage in life they are experimenting with their identities and at the same time learning skills in expressions of self. While physical constraints such as the body, biological sex, race, or age can have a profound effect on self-definition and self-presentation (Collins, 2003), many of these attributes become flexible in online environments. The anonymity afforded to digital natives within virtual worlds allows adolescents more flexibility in exploring their identity through their language, their role play, and the personae they assume (Calvert, Jordan, & Cocking, 2002). Shil'shtein (2001) found that adolescents are likely to express characteristics that make them desirable for relationships, and they look for these characteristics in others. The attraction toward this new phenomenon revolves around the idea that they can present themselves in a way that is not experienced offline. Turkle (1999) states two main characteristics that make the Internet a perfect place for digital natives to experiment with their identity online, first there are reduced audio and visual cues which allow them to change, emphasise or conceal parts of themselves. Second, social communication conducted online is usually with virtual communities that are separate from their real live communities; therefore regular social repercussions are reduced. However, these virtual worlds can also enable participants to exaggerate or idealize their true identity (Turkle, 1994) or even fabricate, conceal and steal others identities (Finch, 2007). Therefore, this phenomena of identity development in virtual worlds requires careful consideration of both the positive and negative impacts it can have.

Self-expression also encompasses the validation and feedback adolescents receive to their profiles. Boyd (2007 p. 15) states that "teens are going online in order to see and be seen by those who might be able to provide validation". This form of social validation eliciting feedback from others and validating one's self-concept (Derlega & Grzelak, 1979) stems from Festinger's (1954) social comparison theory, which proposes that people look to others to determine the appropriateness of their attitudes, behaviours, and values, thus re-enforcing the formation of their identity. In a study by Valkenburg and Peter (2008) it was tested to see whether conducting online identity experiments was beneficial to the offline social competence of adolescents – in terms of allowing them the opportunity to talk to people

of different ages, backgrounds and ethnic groups – or detrimental – in terms of adolescents becoming more familiar with their online self rather than offline self. They found that engaging in online identity experiments had an indirect positive effect on adolescent's social competence.

4   Research Framework

This section presents our research framework. Figure 1 was adapted from Silver Silver (1990) who suggested that Decision Support Systems can either support or degrade decision making processes by amplifying or attenuating existing strengths or weaknesses inherent in the decision maker. Similarly we conjecture that virtual worlds can be either harmful or useful to the identity development, of digital natives based on the amplification attenuation process that occurs of the inherent traits of a digital native. Therefore the research model is placed within the contextual characteristics of virtual worlds (Kozinets & Kedzior, 2009; McKenna, Gardner, & Myers, 2011). These characteristics lay the foundation for the analysis of the traits amplified or attenuated in virtual worlds. For example, the concept of *re-embodiment* allows for gender swapping. This may then enable digital natives to express themselves differently in a virtual world. A transgendered youth may be able to amplify that particular aspect of their identity in a virtual world. Another example could be *multiperspectivity* which allows for multiple avatars. A digital native could have many avatars, which are used to express different identities, therefore some particular aspects of that individual's identity could be spread across multiple avatars, or not exist at all in some avatars as the individual might choose to express each avatar differently.
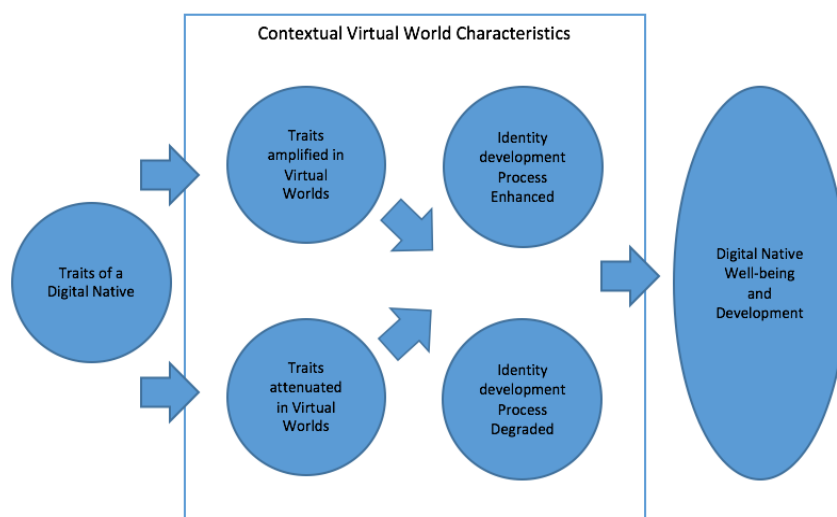

Figure 1.   Research Framework

For example, certain personality traits may get amplified or attenuated within virtual worlds as a result of engagement with different contexts within these worlds. This in could positively or negatively amplify or attenuate meso level processes such as social competence or self-esteem. The amplification or attenuation of these processes could then impact on the overall identity development of digital natives.

There is reason to believe that some of the inherent personality traits of a digital native may be predictive of use of virtual worlds. For instance, it could be argued that individuals who are high in *openness to experience*, with their curious manner and their tendency toward adventure seeking (McCrae, 1996), might be very attracted to online activity as an opportunity to explore and seek out the new and novel (Amichai-Hamburger, 2002; Swickert, Hittner, Harris, & Herring, 2002). Moreover, Kraut et al. (1998) ask whether *introverted* people use other social networking tools to compensate for their weaknesses or *extraverts* use them to magnify their already superior networking efforts and skills. Their findings suggest that it is those who already have strong social networks and skills who benefit the

most from virtual worlds. In turn, access and use of virtual worlds may amplify or attenuate existing differences in the ability to use social resources with those who are already effective in using social resources in the world being well positioned to take advantage of a powerful new technology like the Internet (Kraut et al., 2002). Similarly, there has been research that suggests that other traits such as gender (Gross, 2004; Manago, Graham, Greenfield, & Salimkhan, 2008; Muscanell & Guadagno, 2011) can impact who is in a better position to leverage the opportunities presented by virtual worlds. While some researchers (Cooper, 2006) found that males were more comfortable with the use of technologies than their female counterparts, others, (Lin & Overbaugh, 2009) and (Caspi, Chajut, & Saporta, 2008), assert that females are more prolific, productive and effective in online environments. Interestingly, (Johnson, 2011) concluded that in the short term females might be in a better position to benefit from the Internet due to their cognitive orientation to spaces such as virtual worlds, while in the long term males will begin to use the Internet more for communication purposes and thereby enhance their developmental outcomes as well. In the next section we outline the research methodology we will use to explore this research framework.

5 Research Methodology

The domain of Digital natives and their sense of identity development is a complex and multi-disciplinary phenomenon.   There is a paucity of research done in this area especially in the IS domain. The area of analysis therefore cannot be done primarily by either explanatory or exploratory research; instead the two methodologies need to be combined. Vodanovich et al (2010) make recommendations for a mixture of qualitative and quantitative methodologies that could be used to study the various facets of this phenomenon. They recommend the use of netnography (Kozinets, 2002) a type of virtual ethnography (Hine, 2000) to understand how and why digital natives are using the Internet. We will choose WoW as a virtual world which is popular with Digital natives and use this as the context from which to examine their identity development. We will use netnography as our methodological approach which includes data collection methods such as participant observation, and surveys to gather our data. Participant observation is key to netnographic studies which involves interaction with community members (Myers, 2013). Therefore, netnographic researchers must be active in some part of the community and not be invisible to the people under investigation, but nor should they lead the community (Kozinets, 2010).

For the participant observations, one of the researchers will join a community inside WoW. The community will be identified through virtual "hangouts" and discussions forums relating to WoW. The researcher will participate in community activities and carry out participant observation of community members. Field notes will be taken during involvement with the movement: this will also include the use of screen captures as a form of note taking (McKenna, Myers, & Gardner, 2015). The researchers will also extract data from the community's discussion forums. In order to align with the virtual world characteristics (Kozinets & Kedzior, 2009; McKenna, Gardner, & Myers, 2011), the researcher will join multiple avatars into the community. We anticipate that the fieldwork will last for six months.

We will also design and conduct a survey with digital natives. We envisage that a sample of 600 students participants across the 6 schools chosen for this field study will suffice. The age group chosen for this study will be between 12 and 17, in line with earlier studies done on digital natives (Corrin, Bennett, & Lockyer, 2013; J. Palfrey & Gasser, 2013; Vodanovich et al., 2015). The design of this survey will be motivated by questions to do with identity development in the context of virtual worlds and will be administered by SurveyMonkey. The main aims of this survey are (1) to have an ability to provide a generalisation, (2) overcome the weakness of qualitative analysis and (3) provide additional inputs for further findings analysis. There is empirical evidence to suggest that email/Web-based surveys are cheaper than postal surveys and yield responses that are faster, more complete and more accurate (Klassen & Jacobs, 2001; Schaefer & Dillman, 1998; Schleyer & Forrest, 2000) Web-based surveys offer the additional advantages of real-time response validation, automated data entry, and

programmable context-sensitive skip patterns. The participants of the survey will be identified through schools, we will choose 3 schools in the United Kingdom and 3 schools in New Zealand for comparative purposes. The first step of the process will be the design of an appropriate instrument that would enable the validation of our research framework. This will be followed by pilot testing in order to validate the overall layout and design of the survey and to help eliminate or reword potentially ambiguous questions (de Leeuw, Borgers, & Smits, 2004) A link to the survey will be distributed to participants via email. The data collected in this study will be applied within the theoretical virtual world characteristics as discussed in sections 2.1-3, as well as the research framework from figure 1. Together these two frameworks will be used to create a deep understanding of the impact that virtual worlds may have on the development of self or collective identity of adolescents.

Data analysis will be performed in the manner recommended for virtual worlds by (McKenna, Myers, & Gardner, 2015). Data from online communities such as virtual worlds is very easy collect. This could be in the form of text or other digital items such as images (Urquhart & Vaast, 2012). As the data set is potentially very large, regular methods of analysing qualitative text become problematic. Therefore, McKenna et al. recommends the use of text mining software which can automatically code text and create content themes based on the data. Therefore we will use a qualitative coding software known as Leximancer to achieve this. As also recommended by (McKenna, Myers, & Gardner, 2015), the results extracted from this analysis will be further manually coded in NVivo to ensure that the codes automatically generated are created within the correct context.

The philosophical stance of this study is interpretive. Interpretive studies assume that reality is accessed through social constructions such as language, consciousness and shared meanings (Myers & Young, 1997). The underlying assumption of interpretive research is that it is informed by hermeneutics and phenomenology (Boland, 1985). Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them (Myers, 1997). Interpretive research does not predefine dependent and independent variables, but focuses on the full complexity of human sense-making as the situation emerges (Kaplan & Maxwell, 1994). Interpretive methods of research in IS are "*aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context*" (Walsham, 1993) (p. 90).

6 Conclusion and Research Implications

This paper has set out a research agenda for a study of digital native identity development within virtual worlds. We believe that this is an important area of research because a greater number of digital natives are engaging in virtual realities. We believe that this research is timely because much of an adolescent's formative years may be spent inside virtual spaces, therefore would have a high impact on their personal identity development. The model proposed in this article has implications for digital natives themselves as it will help them understand that particular technologies will help or hinder them in different ways to their peers based on inherent traits such as personality type. This means that a virtual world adopted by a peer group will not have a uniform impact on their identity development.

This study has some limitations. Firstly, it is entirely based on WoW, however as this is a very popular game among digital natives we believe that it is representative of the true nature of digital native identity development. Secondly, this study will be based on identity development western cultures, and we acknowledge that identity development may differ for digital natives from different cultures. In the future, we think this study could be extended to examine other virtual worlds that are popular amongst digital natives such Habbo Hotel or Second Life. The particular characteristics of each type of Virtual World may influence the identity development of digital natives in different ways and therefore, this would be an intriguing area of research. The third limitation is the use of netnography in this research. Netnographic research has its own limitations, for example, the researchers cannot direct verify the authenticity of the participants (age etc), in addition, netnographic researchers have no access to non-verbal communications and have to rely solely on written text, which may influence the interpretation of the data (Mkono, 2012).

References

Amichai-Hamburger, Y. (2002). Internet and personality. *Computers in Human Behavior, 18*(1), 1-10.

Assmann, J. J., Drescher, M. A., Gallenkamp, J. V., Picot, A., Welpe, I. M., & Wigand, R. T. (2010, August 12-15). MMOGs as Emerging Opportunities for Research on Virtual Organizations and Teams Symposium conducted at the meeting of the Americas Conference on Information Systems (AMCIS), Lima, Peru.

Bainbridge, W. S. (2009). Etopia. *Networker, 13*(1), 36-35.

Bainbridge, W. S. (2010a). Online Multiplayer Games. In G. Marchionini (Ed.), *Synthesis Lectures on Information Concepts, Retrieval, and Services*. Online: Morgan & Claypool.

Bainbridge, W. S. (2010b). *The Warcraft Civilzation: Social Science in a Virtual World*. Cambridge, Massachusetts: The MIT Press.

Bell, M. W. (2008). Toward a Definition of "Virtual Worlds". *Journal of Virtual Worlds Research, 1*(1).

Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *British journal of educational technology, 39*(5), 775-786.

Blodgett, B. M. (2009). *And the ringleaders were banned: an examination of protest in virtual worlds*. presented at the meeting of the Proceedings of the fourth international conference on Communities and technologies, University Park, PA, USA. doi:http://doi.acm.org/10.1145/1556460.1556481

Boellstorff, T. (2008). *Coming of Age in Second Life*. Princeton, New Jersey: Princeton University Press.

Boland, R. (1985). Phenomenology: A Preferred Approach to Research in Information Systems. In E. Mumford, R. Hirschheim, G. Fitzgerald, & T. Wood-Harper (Eds.), *Research Methods in Information Systems* (pp. 193-201). Amsterdam: North Holland.

Boyd, D. (2007). Why youth♥ social network sites: The role of networked publics in teenage social life. *The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning*, 119-142.

Calvert, S. L., Jordan, A. B., & Cocking, R. R. (2002). *Children in the digital age: Influences of electronic media on development*: Praeger Publishers/Greenwood Publishing Group.

Caspi, A., Chajut, E., & Saporta, K. (2008). Participation in class and in online discussions: Gender differences. *Computers & Education, 50*(3), 718-724.

Castronova, E. (2005a, 11 November 2010). Synthetic Statehood and the Right to Assemble. Retrieved from http://terranova.blogs.com/terra_nova/2005/02/the_right_to_as.html

Castronova, E. (2005b). *Synthetic Worlds: The Business and Culture of Online Games*: University of Chicago Press.

Castronova, E. (2007). *Exodus to the virtual world: how online fun is changing reality*. New York, NY: Palgrave Macmillan.

Cheng, L., Farnham, S., & Stone, L. (2002). Lessons Learned: Social Interaction in Virtual Environments. In *Digital Cities II: Computational and Sociological Approaches* (pp. 597-604). Retrieved from http://dx.doi.org/10.1007/3-540-45636-8_16

Chesney, T., Coyne, I., Logan, B., & Madden, N. (2009). Griefing in virtual worlds: causes, casualties and coping strategies. *Information Systems Journal, 19*(6), 525–548.

Christopher, T. (2009). In-Game Identities and Meatspace Mistakes. In L. Cuddy & J. Nordlinger (Eds.), *World of Warcraft and Philosophy: Wrath of the Philosopher King* (pp. 165-171). Chicago: Open Court Publishing.

Collins, D. (2003). Pretesting survey instruments: an overview of cognitive methods. *Quality of Life Research, 12*(3), 229-238.

Cooper, J. (2006). The digital divide: The special case of gender. *Journal of Computer Assisted Learning, 22*(5), 320-334.

Corrin, L., Bennett, S., & Lockyer, L. (2013). Digital Natives: Exploring the Diversity of Young People's Experience with Technology. In R. Huang & J. M. Spector (Eds.), *Reshaping Learning* (pp. 113-138): Springer Berlin Heidelberg. Retrieved from http://dx.doi.org/10.1007/978-3-642-32301-0_5. doi:10.1007/978-3-642-32301-0_5

de Leeuw, E., Borgers, N., & Smits, A. (2004). Pretesting questionnaires for children and adolescents.

Derlega, V. J., & Grzelak, J. (1979). Appropriateness of self-disclosure. *Self-disclosure: Origins, patterns, and implications of openness in interpersonal relationships*, 151-176.

Eckert, P. (1989). *Jocks and Burnouts: Social Categories and Identity in the High School*: Teachers College Press

El Kamel, L. (2009). For a Better Exploration of Metaverses as Consumer Experiences. In N. T. Wood & M. R. Solomon (Eds.), *Virtual Social Identity and Consumer Behavior* (pp. 20-40). New York: Society for Consumer Psychology.

Elliott, J., & Kruck, S. E. (2008). Help – Somebody Robbed my Second Life Avatar! [second life, virtual crimes, griefing, phishing]. *Journal of Virtual Worlds Research, 1*(1).

Erikson, E. H. (1980). Themes of adulthood in the Freud-Jung correspondence. In N. J. Smelser & E. H. Erickson (Eds.), *Themes of work and love in adulthood*. Cambridge, MA: Harvard University Press.

Festinger, L. (1954). *A theory of social comparison processes* (Vol. 7): Bobbs-Merrill.

Finch, E. (2007). The problem of stolen identity and the Internet. *Crime online*, 29-43.

Fornäs, J., Klein, K., Landendorf, M., Sundén, J., & Sveningsson, M. (2002). Into Digital Borderlands. In J. Fornäs, K. Klein, M. Landendorf, J. Sundén, & M. Sveningsson (Eds.), *Digital Borderlands: Cultural Studies of Identity and Interactivity on the Internet*. New York: Peter Lang.

Gross, E. F. (2004). Adolescent Internet use: What we expect, what teens report. *Journal of Applied Developmental Psychology, 25*(6), 633-649.

Hagström, C. (2008). Playing with Names: Gaming and Naming in World of Warcraft. In H. G. Corneliussen & J. W. Rettberg (Eds.), *Digital Culture, Play, and Identity* (pp. 265-285). Cambridge, Massachusetts: The MIT Press.

Hine, C. (2000). *Virtual ethnography*: Sage Publications Ltd.

Johnson, G. M. (2011). Internet activities and developmental predictors: Gender differences among digital natives. *Journal of Interactive Online Learning, 10*(2), 64-76.

Jones, S., Millermaier, S., Goya-Martinez, M., & Schuler, J. (2008). Whose space is MySpace? A content analysis of MySpace profiles. *First Monday, 13*(9).

Jung, Y., & Kang, H. (2009). An Exploratory Study of Users' Purposes for Social Virtual Worlds Symposium conducted at the meeting of the Proceedings of the Fifteenth Americas Conference on Information Systems,, San Francisco, California.

Kaplan, B., & Maxwell, J. A. (1994). Qualitative Research Methods for Evaluating Computer Information Systems. In J. G. Anderson, C. E. Aydin, & S. J. Jay (Eds.), *Evaluating Health Care Information Systems: Methods and Applications* (pp. 45-68). Thousand Oaks, CA: Sage.

Klassen, R. D., & Jacobs, J. (2001). Experimental comparison of Web, electronic and mail survey technologies in operations management. *Journal of Operations Management, 19*(6), 713-728.

Klastrup, B. L., & Tosca, S. (2009). "Because it just looks cool!" Fashion as character performance: The Case of WoW. *Journal of Virtual Worlds Research, 1*(3).

Kozinets, R. V. (2002). The Field behind the Screen: Using Netnography for Marketing Research in Online Communities. *Journal of Marketing Research, 39*(1), 61-72.

Kozinets, R. V. (2010). *Netnography. Doing Ethnographic Research Online*. London: Sage Publications Ltd.

Kozinets, R. V., & Kedzior, R. (2009). I, Avatar Auto-Netnographic Research in Virtual Worlds. In N. T. Wood & M. R. Solomon (Eds.), *Virtual Social Identity and Consumer Behavior* (pp. 3-17). New York: Society for Consumer Psychology.

Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet Paradox Revisited. *Journal of Social Issues, 58*(1), 49.

Kraut, R., Patterson, M., Vicki, L., Sarah, K., Tridas, M., & William, S. (1998). Internet paradox. A social technology that reduces social involvement and psychological well-being? *The American Psychologist, 53*.

Lenhart, A., & Madden, M. (2005). *Teen content creators and consumers*. Washington, DC: Pew Internet and American Life Project. Retrieved from http://www.pewinternet.org/pdfs/PIP_Teens_Content_Creation.pdf

Lin, S., & Overbaugh, R. C. (2009). Computer-mediated discussion, self-efficacy and gender. *British journal of educational technology, 40*(6), 999-1013.

Manago, A. M., Graham, M. B., Greenfield, P. M., & Salimkhan, G. (2008). Self-presentation and gender on MySpace. *Journal of Applied Developmental Psychology, 29*(6), 446-458.

McCrae, R. R. (1996). Social consequences of experiential openness. *Psychological Bulletin, 120*(3), 323.

McKenna, B., Gardner, L., & Myers, M. (2011). Issues in the study of virtual world social movements Symposium conducted at the meeting of the 15th Pacific Asia Conference on Information systems (PACIS)

McKenna, B., Gardner, L. A., & Myers, M. D. (2010). Chaotic Worlds: An Analysis of World of Warcraft Symposium conducted at the meeting of the 16th Americas Conference on Information Systems (AMCIS), Lima, Peru.

McKenna, B., Myers, M., & Gardner, L. (2015). *Analysing qualitative data from virtual worlds:using images and text mining*. presented at the meeting of the European, Mediterranean & Middle Eastern Conference on Information Systems (EMCIS), Athens, Greece.

McKenna, K. Y. A., & Bargh, J. A. (1999). Causes and Consequences of Social Interaction on the Internet: A Conceptual Framework. *Media Psychology, 1*(3), 249 - 269.

McKenna, P. (2007). The rise of cyberbullying. *New Scientist, 195*(2613), 26-27.

Meeus, W. (1996). Studies on identity development in adolescence: An overview of research and some new data. *Journal of Youth and Adolescence, 25*(5), 569-598.

Meeus, W. (2011). The study of adolescent identity formation 2000–2010: A review of longitudinal research. *Journal of Research on Adolescence, 21*(1), 75-94.

Messinger, P., Stroulia, E., Lyons, K., Bone, M., Niu, R., Smirnov, K., & Perelgut, S. (2009). Virtual Worlds - past, present, and future: New directions in social computing. *Decision Support Systems, 47*(2009), 204-228.

Mkono, M. (2012). Netnographic tourist research: The internet as a virtual fieldwork site. *Tourism Analysis, 17*(4), 553-555.

Moore, R. J., Gathman, E. C. H., & Ducheneaut, N. (2009). From 3D Space to Third Place: The Social Life of Small Virtual Spaces. *Human Organization, 68*(2), 230-240.

Muscanell, N. L., & Guadagno, R. E. (2011). Make new friends or keep the old: Gender and personality differences in social networking use. *Computers in Human Behavior*.

Myers, M. D. (1997). Critical Ethnography in Information Systems. In A. Lee, J. Liebenau, & J. DeGross (Eds.), *Information Systems and Qualitative Research* (pp. 276-300). London: Chapman and Hall. Retrieved from http://dx.doi.org/books?hl=en&lr=&id=YqFJkwgx7MAC&oi=fnd&pg=PA276&dq=critical+ethnography+in+information+systems&ots=ZQSPTbsEcc&sig=QZGQ0BuTzlRZWk74VCExiYmF4Ks%23v=onepage&q=critical%2520ethnography%2520in%2520information%2520systems&f=false. doi:citeulike-article-id:7338966

Myers, M. D. (2013). *Qualitative Research in Business & Management* (2nd ed.): Sage Publications London.

Myers, M. D., & Young, L. W. (1997). Hidden Agendas, Power, and Managerial Assumptions in Information Systems Development: An Ethnographic Study. *Information Technology & People, 10*(3), 224-240.

Nardi, B. (2010). *My Life as a Night Elf Priest: An Anthropological Account of World of Warcraft*. Michigan, USA: University of Michigan Press.

Nielsen, J., & Loranger, H. (2006). *Prioritizing web usability*. California, USA: New Riders Publishing Thousand Oaks.

Palfrey, J., & Gasser, U. (2013). *Born digital: Understanding the first generation of digital natives*: Basic Books.

Palfrey, J. G., Gasser, U., Maclay, C., & Gerrit, B. (2011). *Digital Natives and the Three Divides to Bridge*: UNICEF.

Papargyris, A., & Poulymenakou, A. (2008). Playing together in cyberspace: Collective action and shared meaning constitution in virtual worlds. In N. Panteli & M. Chiasson (Eds.), *Exploring Virtuality Within and Beyond Organizations* (pp. 213-240). New York, NY: Palgrave Macmillan.

Prensky, M. (2001a). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1-2.

Prensky, M. (2001b). Digital Natives, Digital Immigrants, Part II. Do they really think differently? *On the Horizon, 9*(6).

Prensky, M. (2004). The emerging online life of the digital native: What they do differently because of technology, and how they do it. *Retrieved May, 25*, 2005.

Ryan, A., M. . (2001). The Peer Group as a Context for the Development of Young Adolescent Motivation and Achievement. *Child Development, 72*(4), 1135-1150.

Schaefer, D. R., & Dillman, D. A. (1998). Development of a Standard E-Mail Methodology: Results of an Experiment. *Public Opin Q, 62*(3), 378-397. doi:10.1086/297851

Schleyer, T. K. L., & Forrest, J. L. (2000). Methods for the Design and Administration of Web-based Surveys. *J Am Med Inform Assoc, 7*(4), 416-425.

Schultze, U., & Orlikowski, W. J. (2010). Virtual Worlds: A Performative Perspective on Globally Distributed, Immersive Work. *Information Systems Research, 21*(4), 810-821.

Schultze, U., & Rennecker, J. (2007). Reframing Online Games*Springer Boston.* Symposium conducted at the meeting of the Proceedings of the International Federation of Information Processing Working Groups 8.2 on Information Systems and Organizations and 9.5 on Virtuality and Society, Portland, Oregon, USA.

Shil'Shtein, E. (2001). Characteristics of the presentation of the self during adolescence. *Russian Education & Society, 43*(6), 35-51.

Silver, M. S. (1990). Decision support systems: directed and nondirected change. *INFORMATION SYSTEMS RESEARCH, 1*(1), 47-70.

Swickert, R. J., Hittner, J. B., Harris, J. L., & Herring, J. A. (2002). Relationships among Internet use, personality, and social support. *Computers in Human Behavior, 18*(4), 437-451.

Tapscott, D. (1996). *The digital economy*. New York: McGraw-Hill.

Tapscott, D. (1997). *Growing Up Digital: The Rise of the Net Generation*. New York: McGraw-Hill.

Taylor, T. L. (2006). *Play Between Worlds: Exploring Online Game Culture*. Cambridge, MA: MIT Press. Retrieved from http://site.ebrary.com.ezproxy.auckland.ac.nz/lib/auckland/docDetail.action?docID=10173666

Teo, T. (2013). An initial development and validation of a Digital Natives Assessment Scale (DNAS). *Computers & Education, 67*, 51-57.

Tronstad, R. (2008). Character Identification in World of Warcraft: The Relationship between Capacity and Appearance. In H. G. Corneliussen & J. W. Rettberg (Eds.), *Digital Culture, Play, and Identity* (pp. 249-263). Cambridge, Massachusetts: The MIT Press.

Turkle, S. (1994). Constructions and reconstructions of self in virtual reality: Playing in the MUDs. *Mind, Culture, and Activity, 1*(3), 158-167.

Turkle, S. (1999). Cyberspace and Identity. *Contemporary Sociology, 28*(6), 643-648.

Urquhart, C., & Vaast, E. (2012). Building social media theory from case studies: A new frontier for IS research.

Valkenburg, P. M., & Peter, J. (2008). Adolescents' Identity Experiments on the Internet: Consequences for Social Competence and Self-Concept Unity. *Communication Research, 35*(2), 208-231. doi:10.1177/0093650207313164

Vodanovich, S., Shen, K. N., & Sundaram, D. (2015). Social Competence of Digital Natives: Impact of Social Networking Sites (SNS) Use Symposium conducted at the meeting of the American Conference of Information Systems, Puerto Rico.

Vodanovich, S., Sundaram, D., & Myers, M. (2010). Research Commentary---Digital Natives and Ubiquitous Information Systems. *Information Systems Research, 21*(4), 711-723.

Walsham, G. (1993). *Interpreting Information Systems in Organizations*. Chichester: Wiley.

Williams, D. (2006). Why game studies now? Gamers don't bowl alone. *Games and Culture, 1*, 13-16.