Virtual Communities of Practice in Simulation-Based Healthcare Education: Participation Factors and Content Value Assessment

by

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A thesis submitted in conformity with the requirements for the Degree of Master of Arts Graduate Department of Education in the University of Ontario Institute of Technology

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Abstract

This study is the first known formative analysis of simulation-based healthcare education virtual communities of practice (VCoPs). The goal of this study was to analyse the frequency of participation, factors that influence participation, and strategies used to assess the value and credibility of content in simulation-based healthcare education VCoPs. A sequential mixed-methods approach was used to assess participation and content assessment factors for a sample of 100 online survey respondents and five semi-structured interviews. Participation frequency was directly observed in 11 simulation-based education VCoPs for a one-year period between September 1, 2014 and August 31, 2015. Simulation-based healthcare education VCoPs that were hosted on LinkedIn had poor user engagement compared to VCoPs hosted as independent discussion forums. Qualitative analysis suggested that the perceived unmoderated and commercial nature of LinkedIn VCoPs may have driven low participation rates. Factors that were empirically associated with community participation rates included platform ease of use, trust in the community, direct and indirect personal benefits, self-efficacy and psychological safety. In this study, VCoPs participants rarely engaged in a systematic process of content credibility and value assessment. Rather, heuristic shortcuts were leveraged to assess content, including reputation, enforcement, self-confirmation, expectancy violation, and persuasive intent.
Acknowledgements

I would like to thank my wife Krista, who has been a constant source of inspiration and motivation throughout this process. Her advice to me when faced with the final push of completing this thesis was, “eat the toad”. I watched her “eat the toad” numerous times earlier this year as she completed her PhD dissertation with one toddler demanding significant attention and another soon to come. I still can’t believe how she did it, and I’ll forever be in awe. Krista, we made it! Somehow, we made it.

Thank you to my colleagues in simulation who were so generous with their time in helping me to refine my survey and interview questions, as well as to those who participated in the study. You’ve proven that simulation-based healthcare education professionals are passionate and self-reflective, and I’m proud to be a part of this community. I hope this study is the first of many times that I have the privilege of working with you to examine how we can learn with, from, and about each other.

To my supervisor, Dr. Robin Kay, thank you for always keeping me on track and showing me that being concise and precise aren’t mutually exclusive. Your encouragement and critical eye were extremely valuable, and I can’t overstate how important your ability to simplify and drill down into what’s most important was for me.

Finally, I’d like to dedicate this study to my daughters, Fiona and Eloise. Your curiosity is a gift; my greatest hope is that that you use it to live a life full of wonder and scepticism.
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1 Introduction

1.1 Overview

Digital communications technology has transformed the way that professionals interact in the workplace. In particular, the traditional concept of workplace as an insular entity of independent departments has been disrupted by the affordance of communications technology to facilitate inter and intra-workplace collaboration (Barnett, Jones, Bennett, Iverson, & Bonney, 2012; Tseng & Kuo, 2010; Wenger, McDermott, & Snyder, 2002).

Research on the effect of digital communications technology on workplace norms is relatively new, though precursor theoretical frameworks offer valuable insight into prevailing modes of thought on how professionals share knowledge and construct unique communities. Most notably, Lave and Wenger’s communities of practice framework (CoPs) (Lave & Wenger, 1991; Wenger, 1998; Wenger et al., 2002) reflects a rich history of how workplace learning has evolved from an individualistic activity of knowledge transfer to one of experiential, context-specific community building. This paradigm shift to learning as a social activity is important to understanding the complexities of social professional interaction online (Wenger et al., 2002).

CoPs are defined as any group of professionals, formal or informal, who share common interests, values, and norms, and who have the opportunity to work together towards developing each other personally and professionally (Barnett et al., 2012; Brown & Duguid, 1991; Edmonds-Cady & Sosulski, 2012; Wenger, 1998). These groups can form and act organically or be structured and moderated. Participation in the community
typically spans from novice to expert members. Novices progress by learning to speak the language and adopting the norms of the group and eventually move from peripheral involvement to masterful agency (Wenger, 1998).

The explosion of digital communications technology has facilitated the adoption of CoPs across the virtual sphere, where membership and participation are not bound by physical and temporal proximity. Virtual communities of practice (VCoPs) are simply an online manifestation of Lave and Wenger’s original CoPs framework (Edmonds-Cady & Sosulski, 2012; Wenger et al., 2002).

VCoPs have emerged in a variety of contexts including healthcare (Barnett et al., 2012; Brooks & Scott, 2006), social work (Edmonds-Cady & Sosulski, 2012), post-graduate studies (Cowan, 2011), and corporate environments (S.-W. Hung & Cheng, 2013; Lin, Hung, & Chen, 2009). VCoPs typically form when distance is a limiting factor for in-person interaction, leading to two important differences compared to traditional CoPs. First, VCoPs are more often formed across organisations since users view them as being less risky than in-person meetings within a single organisation (Y. Chen & Hew, 2015). Users feel freer to seek advice, to admit knowledge gaps, and to voice divergent opinions than they would be in in-person communities (Ardichvili, 2008; Oliver & Carr, 2009). Second, VCoPs make it easier for professionals who are relatively few and geographically isolated to gather, form peer support groups, and share their stories and lived experiences. (Hamel, Benyoucef, & Kuziemsky, 2012).

Like many professionals who share common goals and interests, simulation-based healthcare education practitioners have formed a variety of online interest groups that fit under the VCoPs umbrella, including professional association forums, LinkedIn groups,
listservs, and equipment manufacturer forums (see Appendix A for an overview of communities included in this study). Healthcare simulation is an educational methodology whereby authentic clinical experience is replicated to varying levels of fidelity in order for learners to develop knowledge, skills and judgement in a safe, controlled environment, prior to real clinical exposure (Ziv, Wolpe, Small, & Glick, 2003). The field is multi-professional, including technicians, clinicians, faculty, facility managers, administrators, and simulated participants, and its VCoPs reflect this diversity.

1.2 Previous Research

1.2.1 Participation Factors

There are at least seven factors that influence user participation in VCoPs. The ease of using virtual community and users’ comfort level with technology have been identified as being significant (Ardichvili, Page, & Wentling, 2003; Barab, Schatz, & Scheckler, 2004; D. W. Hung & Chen, 2001). Second is time available while at work to participate (Ardichvili et al., 2003; Wenger et al., 2002). Third is direct or indirect personal benefits such as the ability to solve complex problems, share insider knowledge, and network (Ardichvili, 2008; C.-J. Chen & Hung, 2010; Y. Chen & Hew, 2015; Lin et al., 2009; Wasko & Faraj, 2005). Fourth is users’ trust in the virtual community, which includes the degree to which there is a sense of shared values as well as expectations of knowledge-sharing reciprocity (Ardichvili, 2008; Ardichvili et al., 2003; C.-J. Chen & Hung, 2010; Y. Chen & Hew, 2015; Lin et al., 2009; Tschannen-Moran & Hoy, 2001). Fifth is the degree to which a user’s workplace encourages and facilitates participation (Y. Chen & Hew, 2015; DeLong & Fahey, 2000; Hackett, 2000; Janz & Prasarnphanich, 2003). Sixth is perception of self-efficacy, or
how users feel that they have something of value to contribute (Ardichvili, 2008; C.-J. Chen & Hung, 2010; Lin et al., 2009; Wenger et al., 2002). Finally, seventh is how safe users feel to post content in virtual communities without fear of judgement or criticism (Ardichvili et al., 2003; Wenger et al., 2002; Zhang, Fang, Wei, & Chen, 2010).

1.2.2 Content Assessment

Content assessment in a virtual environment can be broken down into two distinct processes. First is effortful evaluation, where users specifically endeavour to establish credibility by checking multiple reputable sources and investigating any applicable scientific methods used to form a conclusion. However, effortful evaluation has been demonstrated to rarely happen in the virtual environments studied in the literature (Fogg et al., 2003; Metzger, 2007). Much more prevalent is the use of cognitive heuristics that function as shortcuts for assessment. The first heuristic identified in the literature is reputation, where users value a poster’s credentials and perceived status in the community (Hilligoss & Rieh, 2008; Metzger & Flanagin, 2013). Second is endorsement, which refers to the tendency for users place a high value on the majority opinion of the community (Metzger, Flanagin, & Medders, 2010; Sundar, 2008). Third is self-confirmation, which is the tendency for content to be valued when it aligns with previous experience, values, and frame of reference, regardless of how well researched it is (Metzger et al., 2010). Fourth is expectancy violation, which is the tendency to discredit content that contains structural errors such as spelling and grammar (Kruger, Wirtz, Van Boven, & Altermatt, 2004; Metzger et al., 2010). Last is persuasive intent, where content is discredited if posted from a source that appears to have a commercial interest (Fogg et al., 2003; Metzger et al., 2010).
1.3 Research Gaps

Healthcare simulation virtual communities includes multiple roles and areas of clinical focus (e.g., social work, pharmacy, medicine, nursing). The wide variety of distinct professions that make up the broader simulation professional umbrella render simulation education VCoPs unique. Generally, a CoP, virtual or otherwise, is comprised of a single professional designation, such as critical care nurses, family medicine physicians, or refrigeration technicians (Li et al., 2009). Therefore, the participation factors identified for unidimensional VCoPs may be different for the multidimensional healthcare simulation communities.

Similarly, given the wide array of professionals involved, it is unclear if the motivation to share knowledge among simulation education professionals follows the same criteria outlined in the unidimensional VCoPs literature. Understanding the motivations for knowledge sharing by healthcare simulation professionals would allow moderators to tailor the features of online communities to users’ needs and perhaps better balance the special interests of individual groups with broader simulation topics that would appeal to a greater audience.

Finally, there is a paucity of research in the VCoPs literature examining how participants assess the credibility and value of content posted. As outlined above, many studies have examined how individuals evaluate the credibility of content posted in various general online media, including blogs, wikis, social networking sites, and online shopping outlets. However, it is not clear how the function of a professional community such as a VCoP may alter how individuals perceive the value and credibility of content.
1.4 Research Goal

The goal of this study is to conduct a formative analysis of healthcare simulation VCoPs focussing on frequency of participation, factors that influence participation, and strategies used to assess the value and credibility of content.
2 Literature Review

2.1 Overview

This literature review consists of three main sections. First, the communities of practice theoretical framework will be examined to clarify what constitutes engagement and defines learning in this context. Second, the factors that influence participation in virtual communities of practice will be reviewed. Third, how users assess the credibility and value of content online will be examined. Relevant theory along with supporting evidence will be used to explore each topic.

2.2 Communities of Practice: Theoretical Framework

The Communities of Practice (CoPs) framework examines the interchange of knowledge and resource sharing, usually in a professional context. First proposed by Lave and Wenger (1991), a CoP is defined as a group of people who share a concern, a set of problems or a passion about a topic and meet regularly to deepen their knowledge, expertise, and social connections. Within a CoP, there is a complex relationship between novices and experts, where a process of ‘legitimate peripheral participation’ socialises users to community norms and hence develops a sense of collective professional identity (Lave & Wenger, 1991; Wenger, 1998). CoPs have been a modern mainstay in the study of many types of professional networks including the business sector, healthcare, education, and technical services (Brown & Duguid, 1991; Li et al., 2009).
2.2.1 Learning Defined

Lave and Wenger's Situated Learning Theory is a useful lens through which to understand how learning manifests in CoPs. From their perspective, learning is intrinsically tied to context and cannot be understood as a collection of objective properties that can be acquired, stored, or manipulated (Lave & Wenger, 1991; Wenger et al., 2002).

The prevailing mode of thought around learning in the workplace is aligned with a model of information exchange (Sfard, 1998). From this perspective, knowledge is a quantifiable, objective entity that can be exchanged between parties, be it master to apprentice, mentor to mentee, or training document to trainee (Brown & Duguid, 1991; Sfard, 1998). Lave and Wenger were among those who challenged the transfer model of learning and developed a view of learning as participative social interplay (Brown & Duguid, 1991; Lave & Wenger, 1991; Sfard, 1998). Through participation, active engagement and assuming increasing responsibility, the individual assumes and acquires the roles, skills, norms and values of the culture and community (Mann, 2011; Wenger et al., 2002). Further, as learners are transformed through participation in the community, their participation, in turn, transforms the community itself (Wenger et al., 2002).

2.2.2 Conflicting Metaphors for Learning

As pointed out by Sfard (1998), Situated Learning, through the CoPs paradigm, represents a radical ontological shift versus traditional learning theories, in that learning is not intrinsically defined by knowledge acquisition. Sfard (1998) argued that the current discourse in education research is caught between two metaphors, acquisition and participation. She noted that regardless of how the learning mechanism operates and
where knowledge originates, the central tenet of a wide range of learning theories, from
behaviourism, to moderate and radical constructivism, to interactionism, to sociocultural
theories, is that the metaphor of learning is one of acquisition (Sfard, 1998). The learner is
somehow gaining possession of knowledge as a commodity and working towards a finite
end-point of understanding. The participation metaphor, as exemplified by theories such
as Situated Learning (Lave & Wenger, 1991), or Apprenticeship in Thinking (Rogoff, 1990),
has a much different ontological position. There, learning is defined as a process whereby
the outsider becomes an active community member, who learns the behaviour and
attitudes of experienced community members (Lave & Wenger, 1991; Mann, 2011; Sfard,
1998).

2.2.3 Problems with a Singular Learning Metaphor

Despite the popularity of the participation metaphor in theorizing of how knowledge
emerges in CoPs, some have noted that there are significant issues that a complete
theoretical shift away from the acquisition metaphor does not address. Most importantly,
there remains the problem of knowledge transfer. An ardent proponent of the participation
metaphor would argue that since all learning is contextual and immaterial, it is impossible
to objectify, or transfer, any aspect of knowledge for use in a novel situation (Lave &
Wenger, 1991; Sfard, 1998). This line of thinking is problematic, as knowledge transfer is
an observed empirical phenomenon, and therefore must be in some way objectifiable and
acquirable (Mann, 2011; Sfard, 1998).

While Situated Learning Theory does much to move the conversation forward on how
learning is defined and achieved in CoPs (i.e., as an expressive, transformative activity), it
does not address the fact that many examples of CoPs and their virtual counterparts noted in contemporary literature are understood largely in the context of acting as vehicles to share and acquire knowledge. The literature is replete with titles such as “Knowledge sharing in virtual distributed environments: Main motivators, discrepancies of findings and suggestions for future research” (Y. Chen & Hew, 2015); “Are you ready for knowledge sharing? An empirical study of virtual communities” (S.-W. Hung & Cheng, 2013); and “The mediating effect of knowledge-sharing processes on organizational cultural factors and knowledge management effectiveness” (Moon & Lee, 2014). Clearly, CoPs, while theorized by Lave and Wenger as a transformational, participatory framework without the exchange of knowledge as a quantifiable entity, are understood, theorized, and studied in practice with a distinct acquisition metaphor at the forefront.

This study considers communities of practice from both an acquisition and participation perspective. As Sfard (1998) notes, neither metaphor alone is sufficient in fully describing the complexity of human learning, interaction, and development. Understanding the dual purpose of virtual communities (i.e., sharing knowledge and building a professional identity) necessitates a nuanced perspective of learning.

2.3 Participation Factors

There are seven factors identified in the literature as being significant influencers on VCoP participation, including platform ease of use, time, personal benefits, trust in community, workplace support, self-efficacy, and psychological safety. Each factor will be defined in the context of this study, followed by an overview of its theoretical background and supporting evidence.
2.3.1 Platform Ease of Use and Comfort with Technology

Ease of use and comfort with technology are defined in the context of this study as the degree to which participation in online communities is mediated by how easy the platform is to use and by users’ relative comfort level with technology.

2.3.1.1 Theoretical Background

When considering technological factors that influence participation in online communities, a theory that has been extensively studied in the literature is the Technology Acceptance Model (Davis, 1989). The Perceived Ease of Use component of the model is defined as “the degree to which a person believes that using a technology will be free from effort” (Davis, 1989). The theory predicts that an easy to use online platform will promote ongoing participation.

2.3.1.2 Supporting Evidence

Several studies have demonstrated that technology can be a significant influencing factor for participation in online communities of practice. In a study of knowledge sharing in healthcare virtual communities, Harrison and Daly (2009) found that proficiency with technology played a significant role in supporting knowledge sharing behaviour. Gupta and Kim (2008) found higher retention in virtual vendor communities that were perceived to be easy to use. Lai et al. (2014) also found that perceptions of high system quality were strongly and positively correlated with participation in professional knowledge management systems.

Perceptions of technology can also act as a significant barrier to participation. In a study of VCoPs at a large multinational corporation, Ardichvili (2003) found that those who
lack technological aptitude or who don’t view technology as an efficient means of communication are much less likely to meaningfully engage.

2.3.2 Time

Time is defined in the context of this study specifically as the time available while at work to participate in VCoPs.

2.3.2.1 Theoretical Background

From a professional VCoP perspective, time available while at work has been integrated by Taylor and Todd (1995) into Ajzen’s (1991) Theory of Planned Behavior (TBP) as a factor for participation. Taylor and Todd (1995) argued that TPB is limited in scope as examining intrinsic motivating factors for participation, and does not account for pragmatic factors such as available time and resources.

2.3.2.2 Supporting Evidence

Time available while at work has been identified as an influencing participation factor in professional virtual communities in multiple empirical studies (Bock, Kankanhalli, & Sharma, 2006; Y. Chen & Hew, 2015; Lai et al., 2014).

2.3.3 Personal Benefits

Personal benefits are defined as the direct and indirect benefits that users derive from participation in VCoPs, which includes increased job performance, the opportunity to share insider knowledge, solve complex problems, network, and progressively develop a sense of professional identity.
2.3.3.1 Theoretical Background

Davis’ (1989) Technology Acceptance Model has been an influential theoretical framework in the study of perceived personal benefits as a participation factor in online communities. The Perceived Usefulness component of the model predicts that users will leverage technology if they gain specific benefits to their job performance, regardless of whether they like using the technology or not (Taylor & Todd, 1995).

Social Capital Theory also provides a useful theoretical context from which to understand how personal benefits influence participation. Social capital as a concept has been theorized since the late 19th century, but it was not until the end of the 1990s that Nahapiet and Goshal (1998) synthesized Social Capital Theory into a comprehensive framework. The basic tenet is that the network of relationships possessed by an individual or a social network and the set of resources embedded within it comprise a tangible benefit, and strongly influences the extent to which interpersonal knowledge sharing occurs. In other words, it is both the content of the community and the social ties that constitute a network’s social capital, and are important measures of value and drivers of participation.

In Social Capital Theory, the user identity dimension is an important determinant of a social network’s capital. Social networks tend to develop within their users a division of roles centred on a set of common goals or interests. User identity not only refers to the strengthening of common goals, but also to the continual development of users’ identification as expert specialist-contributors (Chiu, Hsu, & Wang, 2006). For example, as a social network matures, information-sharing users within the network may become
increasingly relied upon to provide expertise in their respective fields of specialization. This, in turn, increases the social capital of the overall network, as expert contribution is more likely to invite additional expert contribution, raising the profile of the network and increasing the net personal benefits for all users (Chiu et al., 2006; Wasko & Faraj, 2005).

The cognitive dimension of social capital theory reflects the shared mental models that exist between network users and drives personal benefits by influencing users’ perception of professional identity (Chiu et al., 2006). As a network develops, participants are likely to develop a shared language, a routine of communication, and a common framework within a shared context, all of which facilitate information exchange (Y. Chen & Hew, 2015).

2.3.3.2 Supporting Evidence

There is a robust base of empirical evidence that points to personal benefits as a significant factor in virtual community participation. Career advancement and enhancement of professional reputation were identified in five studies (Ardichvili, Maurer, Li, Wentling, & Stuedemann, 2006; Ardichvili et al., 2003; Chiu et al., 2006; Scarbrough, 2003; Wasko & Faraj, 2005). Emotional benefits such as the boosting of self-esteem and feeling useful were identified in three studies (Y. Chen & Hew, 2015; Chiu et al., 2006; Lai et al., 2014). Two studies found that intellectual benefits, such as problem solving, expanding one’s perspective, and finding new challenges were significant (Chiu et al., 2006; Lai et al., 2014). Four studies reported that sharing is a means of building a stronger community and strengthening one’s embeddedness (Ardichvili et al., 2003; Chiu et al., 2006; Scarbrough, 2003; Wasko & Faraj, 2005). Finally, three studies found that shared values and vision, and
growing a sense of professional identity were significant factors (Ardichvili, 2008; Chiu et al., 2006; Lai et al., 2014).

2.3.4 Trust in Community

Trust refers to the degree to which users have faith in the good intentions and efficient functionality of the community, which includes how they perceive that their professional values and expectations of reciprocity align with those of the community.

2.3.4.1 Theoretical Background

Social Capital Theory specifically addresses considerations of a communities’ trust and trustworthiness as well as norms of reciprocity (Nahapiet & Ghoshal, 1998). Trust and trustworthiness can be understood as the likelihood that information exchanged will be used in good faith. For example, participants need to believe that information will not be used to cause harm to any user in the network, either directly or indirectly (Chiu et al., 2006).

Norms of reciprocity refers to the likelihood of a social network to share information as a *quid pro quo* (Nahapiet & Ghoshal, 1998). A social network with a high degree of reciprocity would accumulate social capital, which in turn motivates network users to continue to share information (Chiu et al., 2006). Social Exchange Theory has also been used to explain reciprocity in a network and distinguishes direct reciprocity (at the individual level) from indirect reciprocity (the assumption that the community, in general, will return the favour) (C.-J. Chen & Hung, 2010; Wasko & Faraj, 2005).
2.3.4.2 Supporting Evidence

In a comprehensive review of existing empirical research, Chen and Hew (2015) found that trust is a significant influencing factor for participation in virtual communities. They reported trust as four factors: a) the perception that personal value bases align with those of the community; b) belief in the good intentions of community members to not take advantage of others; c) trust in the community moderators’ ability to both manage the features of the platform and resolve conflict; and d) the expectation that knowledge receivers will return the favour. In the 26 studies included in the review, trust was the most widely reported of all participation influencing factors (Y. Chen & Hew, 2015)

2.3.5 Workplace Support

Workplace support refers to the degree to which a user’s organisation is aware of and actively promotes participation in professional VCoPs.

2.3.5.1 Theoretical Background

Social Capital Theory defines a structural component that is a prerequisite for robust community participation and consists of the network ties that facilitate knowledge exchange (Nahapiet & Ghoshal, 1998). Network ties relate directly to workplace support, as an organisation that promotes participation in VCoPs directly and indirectly builds the topology necessary for users to connect (Chiu et al., 2006).

2.3.5.2 Supporting Evidence

Organisational culture and leadership have often been cited as strong enabling criteria for stimulating VCoPs participation, with a direct relationship between supportive organisational cultures and strong knowledge sharing practices (Y. Chen & Hew, 2015;
DeLong & Fahey, 2000; Janz & Prasarnphanich, 2003). These studies suggest that supportive organisational cultures tend to value knowledge sharing practices and create a safe space to ask questions, share novel solutions, and problem-solve within and across professions and organisations.

The corollary has been found to be true as well. In a study of for-profit organisations, Hackett (2000) found that the second largest barrier to community participation and growth was the fostering a culture of knowledge hoarding. In that study, it was found that users were actively discouraged from sharing best-practices, as company leadership was protective of perceived intellectual property and competitive advantage. Ultimately, a knowledge hoarding culture was associated with a stagnation in innovation (Hackett, 2000).

In a review of the VCoPs research, Ardichvili (2008) found that knowledge hoarding may be specific to organisational or professional norms. For example, salespeople working on commission or for-profit education organisations protecting curriculum.

2.3.6 Self-efficacy

Self-efficacy in the context of VCoPs refers to the degree to which users feel that they have the ability to contribute valuable content and that other users will benefit from their unique experience.

2.3.6.1 Theoretical Background

Social Cognitive Theory, as formulated by Bandura (1986), is a robust body of work through which to understand how the concept of self-efficacy relates to participation in VCoPs. Social Cognitive Theory sees human behaviour as a triadic, dynamic, and reciprocal
interaction of personal factors, behaviour, and social networks (Bandura, 2001). The individual learner brings his or her personal knowledge, skills, attributes and previous experience to the table, and learns and interacts dynamically with all others in the setting (Bandura, 2001; Mann, 2011). Through experience and through observing the actions of others, the individual acquires skills and knowledge and develops a sense of self-efficacy and ability to perform specific tasks (Bandura, 2001). This framework sees an individual’s acquired knowledge and past experiences as a fundamental aspect of the learning process.

Social Cognitive Theory has two distinct dimensions: self-efficacy and outcome expectations. Self-efficacy can be understood as a judgement of one’s own ability to organize and execute given types of performances (Bandura, 2001). Outcome expectations refers to one’s judgement of the likely consequence of such performances (Bandura, 2001). Individuals seek knowledge in order to fill perceived gaps in self-efficacy, with the express purpose of effecting more favourable personal and professional outcomes. As one’s sense of self-efficacy grows, he or she is more likely to take on the role of “knowledge-sharer” vs. “knowledge-consumer” (Chiu et al., 2006). As self-efficacy develops, a community member moves centrally through the community across the novice-to-expert continuum.

2.3.6.2 Supporting Evidence

Self-efficacy has been significantly and positively associated with knowledge sharing behaviour some studies, including an empirical study of college and MBA students (I. Y. Chen, Chen, & Kinshuk, 2009), professional virtual communities in Taiwan (C.-J. Chen & Hung, 2010; Lin et al., 2009), and 39 professional societies in China (Hsu, Ju, Yen, & Chang, 2007).
2.3.7 Psychological Safety

Psychological safety is defined in the context of this study as how safe users feel to post content without the fear of judgement or criticism and includes concerns about appearing to be immodest when offering solutions.

2.3.7.1 Theoretical Background

Psychological safety was first defined and explored in the organizational behavior literature by Kahn (1990). He drew on clinical work stating that therapeutic relationships, families, and organizations create contexts in which people feel more or less safe to take risks in self-expression. Further, he theorized psychological safety as an individual psychological state, rather than an intrinsic personal trait, meaning that it is context specific and driven by social interplay.

2.3.7.2 Supporting Evidence

In a review of the VCoPs literature, Ardichvili (2008) reported that a fear of criticism is a significant barrier to participation. This fear of criticism reflects one’s desire to maintain a stable and positive sense of self-efficacy and that posting in professional virtual communities is typically not done anonymously. Without anonymity, there is a perception that postings that reflect poorly on the author's competence will exist publicly online in perpetuity (Ardichvili, 2008; Ardichvili et al., 2006). There is also significant trepidation about misleading others by posting incorrect, out of date, or out of fashion solutions to problems (Ardichvili, 2008; Ardichvili et al., 2003).

Some researchers have examined cultural factors that may contribute to psychological safety levels in VCoPs. Of particular interest are findings that show a
difference in participation tendencies between collectivist cultures, predominantly in Asia, and the less collectivist cultures of the West. Ardichvili et al. (2006) and Tseng & Kuo (2014) reported that Asian cultures tend to value modesty, which can lead to an under engagement in VCoPs as participants perceive a societal risk in appearing to be overstepping.

There is also the issue of “saving face”, whereby users will be less likely to expose gaps in knowledge because they are expected to represent themselves and their organisation with a distinct air of competence (Ardichvili et al., 2006; Wenger et al., 2002). It is important to note that while the desire to “save face” was particularly prevalent in Asia, it was also a significant factor in many western virtual communities, especially when there was a perceived power differential among users (Ardichvili et al., 2006).

2.4 Content Assessment

A core premise of VCoPs engagement is that users derive value from sharing knowledge, among other factors. As outlined in previous sections, the perceived quality of information is a key element in the robustness of engagement and overall success of professional virtual communities. Yet how users assess the credibility and overall value of information posted in professional VCoPs is unclear. The following sections will review the relevant literature associated with online content assessment. First, a historical perspective of pre-digital credibility assessment will be examined, followed by an operational definition and overview of effortful evaluation. Finally, in contrast to effortful evaluation, the theory and evidence related to the use of cognitive heuristics will be examined.
2.4.1 Pre-digital Mechanisms of Assessment

When examining how content is critically evaluated, it is useful to contrast this with how content was assessed before digital proliferation. In a traditional media environment, there were typically a limited number of information sources and high barriers to the public dissemination of information (Fogg et al., 2003; Metzger, 2007). Credible sources were often characterised by features such as formal positions indicating particular training and education or by job positions requiring specific, relevant experience (Metzger, 2007; Metzger & Flanagin, 2013).

Credible sources of information were often easily recognised by the author’s observable and verifiable credentials, which were rooted in specific qualifications or training (Hilligoss & Rieh, 2008; Metzger & Flanagin, 2013). These so-called “authority indicators” formed the root of an information meritocracy, where dissemination was highly centralised and therefore easy to control and quality-assure (Metzger, 2007; Metzger & Flanagin, 2013).

With the advent of the Internet and the resultant digitisation and democratisation of information exchange, information was abundant, and the pre-digital paradigm of scarcity and easily-discernible source authority indicators became untenable (Metzger, 2007). The information meritocracy gave way to the equal platform, and discerning credibility and quality of information became the responsibility of the information consumer, rather than an intrinsic characteristic of the medium (Metzger, 2007).
2.4.2 Effortful Evaluation

Early research of credibility assessment in the digital landscape operated under the hypothesis that information consumers would engage in a practice of effortful evaluation of information (Metzger, 2007). Effortful evaluation can be conceptualized as a systematic approach to assessment, comprising of a variety of steps one would engage in prior to making a final judgment as to whether a piece of information was credible or not. Metzger (2007) described effortful evaluation as systematically examining the following criteria: a) accuracy, b) authority, c) objectivity, d) currency, and e) comprehensiveness. By carefully considering each of these criteria and formulating a final judgment, one could accurately assess the relative merit of content posted in any online community.

The literature suggests that people rarely engage in this process of effortful evaluation when assessing the credibility of content posted online. In a study of over 2,500 web users, Fogg et al. (2003) reported that the primary consideration for credibility assessment was visual elements of website design. Moreover, in a study of 2,100 college and general adult Internet users over a three-year period, Flanagin and Metzger (2007) found that users report verifying the information they find online only rarely to occasionally, and tend to use verification strategies that require the least effort to perform.

Limited engagement in effortful evaluation may be explained by the Limited Capacity Model of message processing, theorised by Lang (2000). Because people have limited working cognitive capacity, they rarely process all aspects of messages they receive. Instead, they select only some salient features to encode, store, and retrieve. This assumption is consistent with theories from information processing and cognitive science
(Sundar, 2008; Van Merriënboer & Sweller, 2010). Therefore, from a cognitive resources perspective, it is rare that individuals will devote significant time to systematic credibility assessment, especially because of the volume of information on the Internet (Lang, 2000; Metzger & Flanagin, 2013).

2.4.3 Cognitive Heuristics

Metzger et al. (2010) developed a taxonomy of cognitive heuristics for evaluating information in the digital era. Cognitive heuristics constitute information processing strategies that ignore some information to make decisions more quickly and with less effort than more complex methods, thus reducing cognitive load during information processing (Hilligoss & Rieh, 2008; Metzger & Flanagin, 2013; Metzger et al., 2010). Metzger and et al.’s (2010) taxonomy of cognitive heuristics is comprised of five elements, including reputation, endorsement, self-confirmation, expectancy violation, and persuasive intent.

2.4.3.1 Reputation

Reputation refers to the notion that familiar information sources are found to be more credible than less recognisable sources, regardless of other message characteristics (Gigerenzer & Todd, 1999; O’Keefe, 1990). Therefore, “reputation” as it is commonly understood is a somewhat incomplete description. It is not only the broader community’s perception of the source’s credibility but also the individual’s familiarity with the information source, regardless of reputation within a larger group (Metzger & Flanagin, 2013; Metzger et al., 2010).
The reputation heuristic is similar to the “authority indicators” component of pre-digital information credibility establishment (Metzger et al., 2010). Sites that are perceived to be primary or official sources are more likely to be trusted (Hilligoss & Rieh, 2008). However, there is an important nuance in the digital context that needs to be clarified. In the pre-digital context, official sources were a highly centralized meritocracy. In the Internet age of information, individual consumers take a much greater role in judging the veracity of a primary source. Therefore, it is not uncommon for different users to reach different conclusions as to what providers qualify as primary sources on a given topic (Lucassen & Schraagen, 2012).

The reputation heuristic is similar to the *ad verecundiam* fallacy from argumentation theory which involves inappropriately appealing to authority on a topic outside an expert’s field or when there is no expert consensus (Metzger, 2007). The reputation heuristic takes advantage of a human tendency to believe that prestigious people cannot be wrong (Metzger & Flanagin, 2013).

2.4.3.2 Endorsement

People are more likely to trust a source of information if others trust it as well (Lucassen & Schraagen, 2012; Metzger & Flanagin, 2013). Endorsement can be from a known entity or comprised of an aggregate of testimonials from unknown agents (Metzger et al., 2010). If the known entity is a person, the degree to which that person is trusted is highly related to how much they are liked by the individual doing the assessment (Metzger & Flanagin, 2013). Trust via aggregate endorsement is also referred to as the “bandwagon heuristic” and is an important component of credibility assessment online (Sundar, 2008).
2.4.3.3 Self-Confirmation

There is a tendency for people to view information as credible if it conforms to their existing beliefs and values, regardless of how well researched the information is (Metzger et al., 2010). This tendency forms the main tenant of the self-confirmation heuristic. Confirmation bias has long known to be problematic in the assessment of information validity, as people have a tendency to notice and place greater weight on information that supports one’s beliefs, while overlooking or undervaluing information that refutes those beliefs (Fischer, Jonas, Frey, & Schulz-Hardt, 2005). Biases toward attitudinally-consistent information appear to be accentuated when gathering information online, where lack of time and motivation often restrict users’ ability to evaluate all of the information retrieved in a typical search (Fischer et al., 2005). It has been hypothesised that this particular heuristic can result in online communities losing their collective capacity to innovate, as non-normative solutions and ideas are not favoured as highly as those that fit within an established value system (Metzger & Flanagin, 2013).

2.4.3.4 Expectancy Violation

People will tend to judge information as not credible if the medium fails to meet expectation of quality. For example, if there are grammatical and spelling errors, information will be rated as not credible (Fogg et al., 2003; Gigerenzer & Todd, 1999; Metzger et al., 2010). Similarly, poor site design, visual appearance, and navigation are strongly associated with negative credibility evaluation (Metzger et al., 2010).

This evaluation tendency is referred to as the expectancy-violation heuristic. The expectancy-violation heuristic is likely underpinned in part by the “effort heuristic”
(Kruger et al., 2004), which is the human tendency to value objects based on how much effort went into producing them. Kruger et al. (2004), note that “effort equals quality” can be a fallacy, because greater effort does not necessarily or always result in greater quality.

2.4.3.5 Persuasive Intent

The persuasive intent heuristic refers to the tendency to classify information that may be biased as not credible (Metzger & Flanagin, 2013; Metzger et al., 2010). Commercial information is particularly susceptible to triggering this heuristic. Advertising, for example, is a very strong negative credibility cue, especially when the advertising is unexpected (Fogg et al., 2003; Metzger et al., 2010). The presence of advertising cues people to think that they are being manipulated, eliciting an immediate defence mechanism that leads people to mistrust information without further scrutiny (Lucassen & Schraagen, 2012; Metzger & Flanagin, 2013; Metzger et al., 2010).

2.5 Limitations and Gaps in Previous Research

As outlined in the sections above, user participation factors and content assessment processes in virtual communities have been an active area of study. However, there are some significant limitations in the existing literature and contextual factors inherent to the simulation VCoPs landscape that warrant further investigation.

2.5.1 Contextual Factors

To date, the literature does not include any studies of simulation-based healthcare education VCoPs, and there are a number of contextual factors in simulation that may lead to differences in participation factors. For example, consider the participation factor of personal benefits, and specifically the formation of a shared professional identity. It is
unclear if and how users form second professional identity (i.e., simulation-based educator) given that healthcare is comprised of many well-established professions (e.g., nurses, surgeons, psychologists), each with their own identity and value-base. The interprofessional nature of simulation education VCoPs could also have an influence on the trust and psychological safety of the community, given that healthcare has historically been rife with hierarchy and power gradients among the professions (Price, Doucet, & Hall, 2014; Thistlethwaite & Jackson, 2014).

With respect to content assessment and the use of heuristics, there have not been any studies that have targeted healthcare simulation VCoPs. It is possible that users of these VCoPs employ effortful evaluation more frequently than general online interest groups, given that healthcare clinical practice and education have a strong tradition of best evidence (Harden, Grant, Buckley, & Hart, 1999). On the other hand, certain heuristics such as expectancy violation may be especially prevalent in healthcare simulation VCoPs, many of which are international communities and may therefore unfairly penalize the ideas of users who are not proficient at writing in English. Persuasive intent could also be a particularly highly leveraged heuristic, as a number of simulation communities use LinkedIn, a commercial entity featuring sponsored content, to host their discussion groups.

2.5.2 Methodological Factors

The empirical studies of VCoPs included in this literature review constructed participation motivation scales to measure knowledge sharing intent and have made the assumption that knowledge sharing intent is causally associated with actual knowledge sharing behaviour (Ardichvili, 2008; I. Y. Chen et al., 2009; Y. Chen & Hew, 2015; Lai et al.,
To date, the researcher is not aware of any study that used statistical analysis to examine participation factors and participation rates. This study polled users for their VCoP participation rates (i.e., never/observe only, rarely, and often) and used ANOVA to determine if there were differences in participation factors among those groups. This approach integrates the fundamental concept that a healthy community of practice, as defined by Wenger (1998), is expected to contain a continuum of users from novice to expert and participation factors may vary across that continuum. Of particular interest will be to examine differences between those who never contribute and those who do, as this shift from pure observation to legitimate participation is not well researched in the virtual context, but is an important part of what defines a community of practice (Brown & Duguid, 1991; Wenger, 1998; Wenger et al., 2002).

The researcher is not aware of any rigorous mixed-methods studies that have both empirically and qualitatively examined VCoPs. It is the researcher’s position that rich qualitative data will validate and add valuable nuance to empirical findings. For example, in this particular context it would be impossible to study how the complex process of developing a professional identity manifests in simulation VCoPs by using empirical analysis alone. Particularly in light of the ontological conflict between learning in CoPs manifesting as acquisition versus participation (Lave & Wenger, 1991; Mann, 2011; Sfard, 1998), the researcher felt that qualitative methods would be useful to perform a deep dive into how simulation VCoPs users perceive their own meaning-making.
2.6 Research Questions

Specific research questions addressed in this study include:

1. To what degree do users participate in simulation virtual communities?

2. What factors influence user participation in simulation virtual communities?

3. To what extent are cognitive heuristics employed by users of simulation virtual communities to assess the value and credibility of content?

The first question will establish baseline metrics of how robust participation in various simulation communities is, while the second two will examine how the participation factors and content assessment processes identified in the literature apply to healthcare simulation VCoPs in particular.
3 Method

3.1 Design Philosophy

This study is an exploratory formative analysis of participation rates in online simulation communities, factors that influence participation, and criteria that are used to assess the value and credibility of content. This study used a sequential mixed method research design (Creswell & Clark, 2011). Mixed methods research leverages both qualitative and quantitative approaches to explore research questions and integrates the two forms of data sequentially by having one build on the other. This sequential study employed a content analysis of online simulation communities, a survey to collect quantitative and initial qualitative data, and interviews to expand upon and clarify survey data.

3.2 Participants

3.2.1 Online Survey

The participants in the survey portion of this study consisted of 103 simulation-based education professionals of varying roles and clinical foci. Since the invitation to participate was posted on multiple VCoP platforms including forums, LinkedIn groups, and a listserv, it is impossible to ascertain the size of the population pool. The sampling was one of convenience, and respondents were incentivized to participate with the opportunity to win a USD $100 Visa gift card. Respondents who indicated that they had not ever read posts in simulation VCoPs were removed from the survey data (3%, n=3) as they would not have valid responses to the research questions.
Survey participants were predominantly female (67%, n=67; male 33%, n=33). A majority of respondents were from the US (69%, n=69) or Canada (23%, n=23), though there was representation from Australia (3%, n=3), England (1%, n=1), Ireland (1%, n=1), Italy (1%, n=1), and Columbia (1%, n=1). One participant declined to identify a country of residence. Respondents ranged in age from 18 to 24 (1%, n=1), 25 to 34 (8%, n=8), 35 to 44 (29%, n=29), 45 to 54 (36%, n=36), 55 to 64 (24.0%, n=24), and 65 to 74 (2%, n=2).

Participants were asked to identify their roles within simulation-based healthcare education. Responses were grouped into four broad categories: educator (e.g., professor, instructor, curriculum developer), operations (e.g., technician, operations specialist, coordinator), senior leadership (e.g., program director, centre director), and researcher. Fifty percent (n=50) of participants indicated multiple roles. Most participants identified as having an educator role (n=58), followed by operations (n=56), senior leadership (n=26) and researcher (n=24). One participant declined to identify any role.

Participants were asked to identify the primary clinical focus within their simulation program, if applicable. Nursing (n=41) and medicine (n=23) were highly represented, followed by paramedicine (n=6), respiratory therapy (n=2), medical radiation technology (n=2), midwifery (n=1) and physiotherapy (n=1).

The range of years’ experience in working in simulation-based healthcare education was: less than two (6%, n=6), between two and four (20%, n=20), between four and six (26%, n=26), between six and eight (13%, n=13), and more than eight (35%, n=35). There was also a wide range of years’ experience in participating in simulation virtual communities, as reported in Table 1:
Table 1 - VCoPs Participation Experience (n=100)

<table>
<thead>
<tr>
<th>Experience (years)</th>
<th>Observing</th>
<th>Posting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>N/A</td>
<td>23% n=23</td>
</tr>
<tr>
<td>Less than 2</td>
<td>25% n=25</td>
<td>32% n=32</td>
</tr>
<tr>
<td>Between 2 and 4</td>
<td>34% n=34</td>
<td>22% n=22</td>
</tr>
<tr>
<td>Between 4 and 6</td>
<td>19% n=19</td>
<td>10% n=10</td>
</tr>
<tr>
<td>Between 6 and 8</td>
<td>10% n=10</td>
<td>5% n=5</td>
</tr>
<tr>
<td>More than 8</td>
<td>12% n=12</td>
<td>8% n=8</td>
</tr>
</tbody>
</table>

3.2.2 Interviews

Five survey respondents agreed to participate in an interview, for a response rate of 5%. These consisted of three females and two males. Four interview participants lived in the United States and one in Canada.

3.3 Context

This study examined participation rates in online simulation communities, the factors that influence participation, and how participants assess the value and credibility of content. The landscape of virtual communities in simulation is diverse and spans many communication platforms and areas of focus. The researcher leveraged his experience along with a colleague in simulation to identify active online communities for inclusion in this study, which are presented in Appendix A.

The virtual communities included in this study typically fit one of two platforms: online forums or LinkedIn groups. Most forums were open registration, though one was closed behind paid membership in a professional association, which the researcher belongs to (Society for Simulation in Healthcare SimConnect). One community, the Standardized Patient Trainer (SP-Trainer), uses an email listserv that is interfaced to a Google Group for
search and archival purposes. The Society for Simulation in Healthcare is the only organisation included that employed both a forum and a LinkedIn Group.

3.4 Data Collection Tools

3.4.1 Online Survey

The online survey (Appendix B) consisted of three main components: a) multiple choice demographic and participation frequency questions; b) five-point Likert questions (strongly disagree to strongly agree) ascertaining levels of agreement regarding influencing factors for community participation and credibility assessment; and c) open-ended questions about participation and credibility assessment factors.

3.4.1.1 Demographic and Participation Frequency Questions

The first six questions on the survey (Appendix B, Q1-6) collected demographic data on the participants such as gender, age, country of residence, role and experience in simulation-based healthcare education, and primary professional area of practice. Additionally, respondents were asked about their online simulation community participation experience for both for observing and actively posting (Appendix B, Q7-9).

3.4.1.2 Participation Factors (Likert Questions)

Seven key factors identified in the literature as being important predictors of online community participation were used to create five-point Likert questions ranging from strongly disagree to strongly agree. The factors were ease of use (2 items), time (1 item), personal benefits (5 items), trust in community (4 items), workplace support (2 items), self-efficacy (2 items), and psychological safety (2 items). The number of items used to constitute a factor depended on the complexity of the underlying construct. For example,
one item was allocated for time, as it is an unambiguous construct in this context, while personal benefits is relatively nuanced and required five items. Participation factor scales were assessed for internal consistency using Cronbach’s alpha with a cutoff value of 0.70 used for determination of reliability, which is acceptable in the context of social sciences Likert data (Gliem & Gliem, 2003).

3.4.1.2.1 Ease of use factor

Community platform ease of use and participant comfort with technology were identified by researchers as key factors for participation (Ardichvili et al., 2003; Barab et al., 2004; D. W. Hung & Chen, 2001). Respondents were asked to assess how much the ease of use of a virtual community’s interface, as well as how much their relative comfort level with technology, affects participation (Appendix B, Q10-11). The internal consistency, as measured by a Cronbach’s alpha of 0.58 was low (Gliem & Gliem, 2003), therefore response to the two items for this factor will be treated individually.

3.4.1.2.2 Time factor

The time that users have to while at work has been identified as a key influencing factor for professional VCoPs participation (Ardichvili et al., 2003; Wenger et al., 2002). Respondents were asked a single Likert question about how much time they have while at work to participate (Appendix B, Q12).

3.4.1.2.3 Personal benefits factor

Five Likert questions were used to establish the degree to which respondents are motivated to use simulation virtual communities because they perceive there to be either a direct or indirect benefit (Appendix B, Q13-17). Personal benefits such as the ability to
solve complex problems, share insider knowledge, develop a professional identity, and network were identified in multiple studies as a key participation factor (Ardichvili, 2008; C.-J. Chen & Hung, 2010; Y. Chen & Hew, 2015; Lin et al., 2009; Wasko & Faraj, 2005).

These five Likert questions had an acceptable level of internal consistency, as measured by a Cronbach's alpha of 0.72 (Gliem & Gliem, 2003).

**3.4.1.2.4 Trust in community factor**

Four Likert questions were used to assess the degree to which respondents feel that they have faith in the good intentions and efficient functionality of the community, which includes how they perceive that their professional values and expectations of reciprocity align with those of the community (Appendix B, Q18-21). Trust in community was identified as an important participation factor in multiple studies (Ardichvili, 2008; Ardichvili et al., 2003; C.-J. Chen & Hung, 2010; Y. Chen & Hew, 2015; Lin et al., 2009; Tschannen-Moran & Hoy, 2001). The scale had an acceptable level of internal consistency, as determined by a Cronbach's alpha of 0.70 (Gliem & Gliem, 2003).

**3.4.1.2.5 Workplace support factor**

Two Likert questions (Appendix B, Q22-23) were used to assess the degree to which workplace support is an influencing factor in online simulation community participation, a key determinant identified in the literature (Y. Chen & Hew, 2015; DeLong & Fahey, 2000; Hackett, 2000; Janz & Prasarnphanich, 2003). The scale had a good level of internal consistency, as determined by a Cronbach's alpha of 0.87 (Gliem & Gliem, 2003).

**3.4.1.2.6 Self-efficacy factor**
Two Likert questions were used to assess how respondents feel that their sense of self-efficacy influences participation in online simulation communities (Appendix B, Q24-25). Self-efficacy relates to the degree to which participants feel that they have something of value to contribute, a construct that is supported by the literature (C.-J. Chen & Hung, 2010; Chiu et al., 2006; Lin et al., 2009). The scale had an acceptable level of internal consistency, as determined by a Cronbach’s alpha of 0.77 (Gliem & Gliem, 2003).

### 3.4.1.2.7 Psychological safety factor

Two Likert questions (Appendix B, Q26-27) were used to assess how safe respondents feel to post content in virtual simulation communities without fear of judgement or criticism, a factor identified in the literature (Ardichvili et al., 2003; Wenger et al., 2002; Zhang et al., 2010). The scale had a good level of internal consistency, as determined by a Cronbach’s alpha of 0.83 (Gliem & Gliem, 2003).

### 3.4.1.3 Participation Factors (Open-ended Questions)

Survey respondents were asked to provide additional detail and clarification regarding what influences their participation in online simulation communities with three open-ended questions focusing on enablers, barriers and motivating factors for participation (Appendix B, Q28-30).

### 3.4.1.4 Content Credibility and Value Assessment (Likert Questions)

The heuristic framework developed by Metzger et al. (2010) was used to create six content assessment factors, which comprised of 12 five-point Likert questions ranging from strongly disagree to strongly agree. The factors were effortful evaluation (3 items), reputation (2 items), endorsement (1 item), self-confirmation (3 items), expectancy
violation (3 items), and persuasive intent (1 item). As with the participation factors, the number of items used to constitute a content assessment factor depended on the complexity of the underlying construct. Content assessment factor scales were assessed for internal consistency using Cronbach’s alpha with a cutoff value of 0.70 used for determination of reliability, which is acceptable in the context of social sciences Likert data (Gliem & Gliem, 2003).

3.4.1.4.1 Effortful evaluation

Three Likert questions (Appendix B, Q31-33) were used to assess how much active effort participants employ when they are assessing the value and credibility of content. This is a measure of non-heuristic assessment processes. The internal consistency of the three questions is low (Gliem & Gliem, 2003), as measured by a Cronbach’s alpha of 0.60. Therefore, these three questions will be interpreted individually.

3.4.1.4.2 Reputation heuristic

Two Likert questions were used to assess the degree to which respondents use the reputation heuristic to evaluate the value of content (Appendix B, Q34-35). This heuristic lends credibility to content posted by a known authority, or by a poster who is highly credentialed (Hilligoss & Rieh, 2008; Metzger & Flanagan, 2013). These two questions constitute an acceptably reliable scale for the construct, as measured by a Cronbach’s alpha of 0.79 (Gliem & Gliem, 2003).

3.4.1.4.3 Endorsement heuristic

One Likert question was used to establish the degree to which respondents use the endorsement heuristic to evaluate the credibility of content (Appendix B, Q36). The
endorsement heuristic refers to the tendency for people place a high value on the majority opinion of the community (Metzger et al., 2010).

3.4.1.4.4 Self-confirmation

Two Likert questions were used to assess the degree to which respondents use the self-confirmation heuristic when evaluating the credibility of content (Appendix B, Q37-38). Self-confirmation relates to the tendency for content to be valued when it aligns with the reader’s previous experience, values, and frame of reference, regardless of how well researched it is (Metzger et al., 2010). The internal consistency of these two questions, as measured by a Cronbach’s alpha of 0.80, is considered acceptable by Gliem and Gliem (2003).

3.4.1.4.5 Expectancy violation

Three Likert questions were used to assess the degree to which respondents use the expectancy violation heuristic when evaluating the credibility of content (Appendix B, Q39-41). Expectancy violation relates to how participants associate structural errors (e.g., spelling, grammar) with a lack of credibility (Kruger et al., 2004; Metzger et al., 2010). The internal consistency of these three questions, as measured by a Cronbach’s alpha of 0.79, is considered acceptable by Gliem and Gliem (2003).

3.4.1.4.6 Persuasive intent

One Likert question was used to assess the degree to which respondents use the persuasive intent heuristic to evaluate the credibility of content (Appendix B, Q42). Persuasive intent refers to the tendency to discredit content posted from a source that appears to have a commercial interest (Fogg et al., 2003; Metzger et al., 2010).
3.4.1.5 Content Credibility and Value Assessment (Open-ended Questions)

Survey respondents were asked two open-ended questions to provide additional detail and clarification regarding how they assess the value of content in online simulation communities (Appendix B, Q43-44). These questions focused on how respondents decide whether to integrate knowledge into their practice, as well outlining as any assessment processes not covered in the survey.

3.4.2 Interviews

Interview questions were constructed and refined following a preliminary analysis of the open-ended survey responses to clarify and add nuance to emergent survey participation themes (Appendix C, Q1-6). In particular, interviewees were probed about their perception of whether simulation virtual communities tend to be open and willing to share information versus being protective of proprietary knowledge (Appendix C, Q3a). Interviewees were also asked to comment on their time available to contribute to online simulation communities and how much their organisation values their contributions, to clarify conflicting reports in the time and workplace support themes (Appendix C, Q5). Interviewees were then asked to comment on how the prevalence of novice content in simulation communities affects their motivation to participate (Appendix C, Q6).

Finally, interviewees were asked to outline their process for assessing content credibility and value (Appendix C, Q7). Interviewees were specifically probed about how their content credibility assessment process may differ among online platforms (Appendix Y, Q7a).
3.4.3 Content and Face Validity

Both the online survey and the semi-structured interview questions were vetted by two experts in simulation-based healthcare education to establish content and face validity. Each expert had the opportunity to review the survey and interview questions, and provided feedback on question clarity, flow, and subject comprehensiveness.

3.5 Procedure

3.5.1 Community Analysis

The virtual communities included in this study (Appendix A) were analysed for frequency metrics for posts made between September 1st, 2014, and August 31st, 2015. Replies to original threads that started before September 1st, 2014, were excluded. The community analysis occurred between September 7th and September 11th, 2015. No identifying information was collected from community participants.

3.5.2 Online Survey

For the online survey component of this study, a recruitment message containing a Survey Monkey link (Appendix D), was posted in various online simulation communities (Appendix A) on September 14th, 2015.

The following statement was included on the first page of the survey (Appendix B) to obtain participant consent: "By clicking 'Next' below, you confirm that you have read the information above, that all of your questions have been answered to your satisfaction, and that you agree to participate in this study." Participants were not able to proceed with the survey until they clicked "Next".
3.5.3 Interviews

At the end of the online questionnaire, participants were asked to email the researcher if they were interested in participating in the semi-structured interview portion of the study. Upon receipt of this email, an interview consent form was sent to the prospective participant (Appendix E), and a time was scheduled at the participant’s convenience. The contents of the information letter and request for consent were reviewed and consent was confirmed at the beginning of each interview. Participants were specifically asked whether they still agreed to the audio-recording of the interview. Interviews were conducted in October 2015. Interviews were transcribed by the researcher.

3.6 Data Analysis

3.6.1 Overview

This research represents a formative analysis of SBHE VCoP participation rates, factors that may affect those rates, and content credibility and value assessment factors. A summary of the data collection and analysis used to answer each research question is presented below in Table 2:
### Table 2 - Overview of Research Design and Data Analysis Methods

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Source</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To what degree do users participate in simulation virtual communities?</td>
<td>• Posts made between September 1st, 2014 and August 31st, 2015 in the communities listed in Appendix A.</td>
<td>• Community posting frequency analysis, including: a) average posts per day; b) % of threads replied to; and c) average replies per thread.</td>
</tr>
<tr>
<td></td>
<td>• Survey question polling participation rates (Appendix B, Q9).</td>
<td>• Participation coded as never, rarely, often.</td>
</tr>
<tr>
<td>2. What factors influence user participation in simulation virtual communities?</td>
<td>• Online survey participation factor Likert questions and scales: a) community ease of use and comfort with technology; b) time; c) personal benefits; d) trust in community; e) workplace support; f) self-efficacy; and g) psychological safety (Appendix B, Q10-27).</td>
<td>• Descriptive statistics and frequency analysis of survey questions and scales.</td>
</tr>
<tr>
<td></td>
<td>• Online survey open-ended questions (Appendix B, Q28-30).</td>
<td>• One-way ANOVA used to identify significant differences in participation factor scores between posting frequency groups (never, rarely, often).</td>
</tr>
<tr>
<td></td>
<td>• Semi-structured interview questions (Appendix C, Q1-6).</td>
<td>• Content analysis of open-ended survey questions and semi-structured interviews.</td>
</tr>
<tr>
<td>3. To what extent are cognitive heuristics employed by users of simulation virtual communities to assess the value and credibility of content?</td>
<td>• Online survey heuristic Likert questions and scales: a) effortful evaluation; b) reputation; c) endorsement; d) self-confirmation; e) expectancy violation; and f) persuasive intent (Appendix B, Q31-42).</td>
<td>• Descriptive statistics and frequency analysis of survey questions and scales.</td>
</tr>
<tr>
<td></td>
<td>• Online survey open-ended questions (Appendix B, Q43-44).</td>
<td>• Correlation analysis of survey question and scale scores.</td>
</tr>
<tr>
<td></td>
<td>• Semi-structured interview question (Appendix C, Q7).</td>
<td>• Content analysis of open-ended survey questions and semi-structured interviews.</td>
</tr>
</tbody>
</table>
3.6.2 Participation Frequency

3.6.2.1 Frequency Analysis

To quantify engagement in the communities included in this study (Appendix A), the following metrics were calculated: a) average posts per day; b) percent of threads replied to; and c) average replies per thread. *Average posts per day* simply reflects the community’s total activity and is not a robust measure of community engagement. *Percent of threads replied to* quantifies the degree to which users’ posts generate any level of response. *Average replies per thread* generates a general measure of the overall level of discussion generated from a new question or discussion item. For example, a community with an average of exactly one reply per thread would imply that in general, new posts generate a single response.

Posting frequencies were calculated by using the community’s advanced search function and searching for all threads between September 1st, 2014 and August 31st, 2015. For communities without a search function, each thread was manually counted. *Average posts per day* was calculated by dividing the total number of posts in all threads by 365. *Percent of threads replied to* was calculated by counting the number of threads that had at least one reply and dividing by the total number of threads.

3.6.2.2 Participation Metric

The following active participation options were used on the survey questions: a) never; b) less than once per month; c) once per month; d) once per week; e) two to three times per week; f) once per day; and g) multiple times per day. These rates were coded into three
groups: never (option a), rarely (option b), often (options c to g). These three groups were used for all participation factor one-way ANOVAs.

3.6.3 Participation Factors

3.6.3.1 Likert Questions and Scales

All participation factors were analysed according to mean, standard deviation, percent agree (including agree and strongly agree) and percent disagree (including disagree and strongly disagree). Normalised mean scores and standard deviations were calculated for all internally reliable aggregate participation factor scales (personal benefits, trust in community, workplace support, self-efficacy, and psychological safety).

One-way ANOVA was used to determine if respondents’ participation factor scores differed among active participation levels (never, rarely and often). In order to employ ANOVA, the approximate normality of each scale’s dataset had to be confirmed for each active participation level, which was done by visually inspecting the Normal Q-Q Plot. Additionally, each group was analysed for equality of variances via Levene’s test. Between-group significance levels were analysed using Tukey’s post hoc test. Statistical significance was determined at the $p < 0.05$ level.

3.6.3.2 Open-ended Survey Questions and Semi-structured Interviews

Responses to both the open-ended survey and interview questions were collated and thematically analysed based on the same factors identified in the literature review used to construct the survey scales. These themse inlcuded a) community platform and comfort with technology; b) time; c) personal benefits; d) trust in community; e) workplace
support; f) self-efficacy; and g) psychological safety. Both positive and negative responses were identified for each influencing factor.

3.6.4 Content Assessment

3.6.4.1 Likert Questions and Scales

Each content assessment five-point Likert question was analysed according to mean, standard deviation, percent agree (including agree and strongly agree) and percent disagree (including disagree and strongly disagree). Mean scores (normalised to a five-point scale) and standard deviations were calculated for all reliable aggregate cognitive heuristic scales (reputation, self-confirmation, and expectancy violation).

A correlation analysis was used to assess the degree to which the various cognitive heuristics (e.g., reputation, endorsement, self-confirmation, expectancy violation, persuasive intent) were associated with each other. Spearman’s rho was used for the correlation analysis, as the data were ordinal and non-parametric. Statistical significance was determined at the $p < 0.05$ level (2-tailed).

3.6.4.2 Open-ended Survey Questions and Semi-structured Interviews

Responses to both the open-ended survey and interview questions were collated and thematically analysed according to the same factors identified in the literature review used to construct the survey scales. These included a) non-heuristic, effortful evaluation; b) reputation; c) endorsement; d) self-confirmation; e) expectancy violation; and f) persuasive intent. Responses needed to demonstrate convincing evidence of either effortful or heuristic evaluation to be included in the results.
4 Results

4.1 Participation Frequency

4.1.1 Comparison of Online Platforms

Online communities with forums hosted by their parent organisation \((n = 3)\) had higher participation frequencies than LinkedIn groups \((n = 7)\). Forums ranged from a mean of 0.8 to 4.6 posts per day, a proportion of posts replied to from 50% to 80%, and a mean number of replies per thread from 2.4 to 3.7. The forum that had a paid membership structure (SimConnect) had strong participation metrics, with the highest mean posts per day of all the forums (4.8), a proportion of threads replied to of 63% and a mean number of replies per thread of 2.7.

Groups hosted on LinkedIn had low participation metrics. Although mean posts per day were relatively high in some cases (as high as 1.7), no LinkedIn group had a thread response proportion of more than 36%, meaning that in even the most vibrant LinkedIn community, nearly two-thirds of new posts did not garner any discussion at all. Table 3 outlines the complete participation metrics for all communities studied, sorted by average replies per thread.
<table>
<thead>
<tr>
<th>Community Name</th>
<th>Platform</th>
<th>Registered users</th>
<th>Avg posts per day</th>
<th>% of threads replied to</th>
<th>Avg. replies per thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>National League for Nursing Simulation Innovation Resource Center</td>
<td>Open Forum</td>
<td>Unknown (not published)</td>
<td>0.9</td>
<td>51%</td>
<td>3.7</td>
</tr>
<tr>
<td>Society for Simulation in Healthcare SimConnect</td>
<td>Paid Members Only Forum</td>
<td>3,600</td>
<td>4.6</td>
<td>63%</td>
<td>2.7</td>
</tr>
<tr>
<td>Laerdal Simulation User Network</td>
<td>Open Forum</td>
<td>123,340*</td>
<td>0.8</td>
<td>80%</td>
<td>2.4</td>
</tr>
<tr>
<td>INACSL - International Nursing Association for Clinical Simulation and Learning</td>
<td>LinkedIn Group</td>
<td>1,907</td>
<td>2.3</td>
<td>32%</td>
<td>1.7</td>
</tr>
<tr>
<td>Gathering of Healthcare Simulation Technology Specialists - SimGHOSTS</td>
<td>LinkedIn Group</td>
<td>562</td>
<td>2.0</td>
<td>36%</td>
<td>1.6</td>
</tr>
<tr>
<td>SP-Trainer</td>
<td>Listserv</td>
<td>135</td>
<td>1.6</td>
<td>35%</td>
<td>1.1</td>
</tr>
<tr>
<td>HealthySimulation - Medical Simulation News and Resources</td>
<td>LinkedIn Group</td>
<td>2,759</td>
<td>2.1</td>
<td>29%</td>
<td>0.6</td>
</tr>
<tr>
<td>Society for Simulation in Healthcare</td>
<td>LinkedIn Group</td>
<td>1,467</td>
<td>0.4</td>
<td>24%</td>
<td>0.5</td>
</tr>
<tr>
<td>Center for Medical Simulation Networking Group</td>
<td>LinkedIn Group</td>
<td>2,865</td>
<td>0.7</td>
<td>6%</td>
<td>0.1</td>
</tr>
<tr>
<td>SIM-one - Ontario Simulation Network</td>
<td>LinkedIn Group</td>
<td>171</td>
<td>0.2</td>
<td>6%</td>
<td>0.1</td>
</tr>
<tr>
<td>Society in Europe for Simulation Applied to Medicine - SESAM</td>
<td>LinkedIn Group</td>
<td>404</td>
<td>0.1</td>
<td>0%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

*Note. *Nature of forum permits users and organisations to have multiple accounts
4.1.2 Respondent Participation Frequency

As a group, survey respondents tended to read posts more often than they actively posted. Frequencies were coded into three groups: never, rarely (less than once per month), and often (once per month or more). Ninety-seven percent of respondents often read posts, while only 40% often posted content. Just over 20% of respondents never posted content, and just under 40% rarely posted. Table 4 outlines the self-reported participation frequencies for both observing and posting:

Table 4 – Frequency of Participation (n = 100)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Read Posts</th>
<th>Post Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>Less than once per month</td>
<td>3</td>
<td>38</td>
</tr>
<tr>
<td>Once per month</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Once per week</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>2-3 times per week</td>
<td>29</td>
<td>6</td>
</tr>
<tr>
<td>Once per day</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>Multiple times per day</td>
<td>20</td>
<td>1</td>
</tr>
</tbody>
</table>

4.2 Participation Factors

4.2.1 Community Platform and Comfort with Technology

4.2.1.1 Likert Questions

Almost 90% of respondents agreed that the ease of use of a simulation virtual community’s interface is a significant factor in determining how much they participate. On the other hand, just over half of respondents agreed that their comfort level with technology affected how much they participated (Table 5).
Table 5 - Likert questions – Community platform and comfort with technology (n=98)

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of using interface</td>
<td>4.2</td>
<td>0.9</td>
<td>7%</td>
<td>89%</td>
</tr>
<tr>
<td>Comfort level with technology</td>
<td>3.4</td>
<td>1.2</td>
<td>18%</td>
<td>54%</td>
</tr>
</tbody>
</table>

1Five-point Likert scale from strongly disagree to strongly agree
2Both agree and strongly agree
3Both disagree and strongly disagree

With respect to how ease of use affects participation, the results from the ANOVA revealed that there was a significant difference among the never, rarely, and often participate groups, \((F(2,95) = 2.8, p < 0.05)\). A Tukey’s post hoc analysis indicated that those who often posted \((M=4.3, SD=0.8)\) scored significantly higher in perceived ease of using interface than those who never posted \((M=3.7, SD=1.2, p < 0.05)\). No other post hoc comparisons were significant.

There were no significant differences among the never, rarely, and often participate groups with respect to comfort level with technology \((F(2,95) = 0.002, ns.)\).

4.2.1.2 Open-ended Survey Questions

Fifteen comments from the open-ended survey were related to how the features of a community platform affect motivation and likeliness to participate. Six of the comments (40%) listed enabling features (e.g., ability to receive a daily email summary of new postings, ease of navigation) as being important. Nine (60%) of the comments referred to participation barriers such as paid memberships and lack of compatibility between technologies. Table 6 provides representative comments:
Table 6 – Community Platform Enablers and Barriers (n=15)

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Sample Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enablers (n=6)</td>
<td>“Daily synopsis/digest emailed sent [sic] each morning provides a way for me to see all the active conversations.”</td>
</tr>
<tr>
<td></td>
<td>“[I like the] easy access to the site and ability to sort by category.”</td>
</tr>
<tr>
<td>Barriers (n=9)</td>
<td>“Cost of memberships.”</td>
</tr>
<tr>
<td></td>
<td>“Sometimes various technology doesn’t play well together, making some communities more trouble than they are worth to access.”</td>
</tr>
<tr>
<td></td>
<td>“Having to register and be a member of an online community is a barrier to participation. The easier it is to access the forum, the more likely I will use it.”</td>
</tr>
</tbody>
</table>

4.2.1.3 Semi-structured Interviews

When asked about the platform features of virtual communities that they liked best, most interviewees mentioned that they appreciated a community platform that made it as easy as possible to interact with both the content and other members. Three out of the five interviewees made direct reference to preferring communities that allow email responses (instead of needing to log into the platform itself) as email was their preferred and most expedient method of professional communication. Interviewee 3 expressed particular frustration with needing to log into the community platform to participate:

“For SSH [Society for Simulation in Healthcare SimConnect] I use the email blasts and I try to stay in the email, but again, SSH pulls you eventually into their site. Nobody out there has good tools... It never remembers you; once you log in it forgets where you’re trying to go and you have to go back to your email and click it again.”
4.2.2 Time

4.2.2.1 Likert Questions

Almost half (46%) of respondents noted that they had sufficient time while at work to participate in virtual communities (Appendix A, Q3), while nearly one-third (34%) indicated that they did not. The mean score for time available was 3.1 (SD = 1.2) on a five-point scale. There were no significant differences among the never, rarely, and often participation groups with respect to how much time they have while at work to contribute \((F(2,95) = 0.8, \text{ ns})\).

4.2.2.2 Open-ended Survey Questions

Thirty-four comments from the open-ended survey questions were related to how time affects respondents’ ability to participate. Twenty-nine (85%) of the comments referenced lack of time as a barrier to participation with the common theme being that core duties take precedence over participating in online communities. Five (15%) of the comments referenced time available as an enabling factor. The nature of their role allowed for participation during work hours, or their desire led them to set time aside outside of work to participate. Table 7 highlights representative comments:
Table 7 – Time as an Enabler and Barrier (n=34)

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Sample Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enablers (n=5)</td>
<td>“[I have a] full-time position without teaching load.”</td>
</tr>
<tr>
<td></td>
<td>“Time of day/evening when I read these.”</td>
</tr>
<tr>
<td></td>
<td>“My desire to take time to participate.”</td>
</tr>
<tr>
<td>Barriers (n=29)</td>
<td>“Not enough hours in the day.”</td>
</tr>
<tr>
<td></td>
<td>“Managing priorities[.] [I]t always falls at the end of my priorities and more pressing things get [in] the way of me participating.”</td>
</tr>
<tr>
<td></td>
<td>“My answers often lead to requests for detailed information, instructions, forms, templates, or access to research information. I don't have time to follow up.”</td>
</tr>
</tbody>
</table>

4.2.2.3 Semi-structured Interviews

When asked if a lack of time is an issue that limits their participation, four interviewees did not have an issue with time personally. However, some did believe that a lack of time probably limited contributions, as many simulation experts are too busy to devote time to a community of practice. Interviewee 2 reported that even if time is available up front, there is a hesitation to read postings because of feeling obligated to respond. Interviewee 5, who was relatively new to simulation, reported a lack of time as affecting the team’s potential in moving their simulation practice forward:

“I would love to be able to spend more of my time during the day networking with other people and getting a sense of what other people are doing and finding out what the latest research says but I don’t have the time. And I feel like that’s doing a disservice not only to me but also to my team because I can’t integrate or figure out how to start getting the ball rolling and start incorporating this into our training curriculum because there is just no time.”
4.2.3 Personal Benefits

4.2.3.1 Likert Questions

Survey results suggested that respondents are motivated to participate in online simulation communities because of gaining personal benefits. Almost 90% of the respondents agreed that participating in online communities expands one’s professional network. More than three-quarters of respondents cited the ability to share insider knowledge as appealing. Approximately 60% of respondents turned to online communities to solve complex problems, or shared knowledge to gain direct professional benefits. However, only 40% believed that participation in online communities influenced how they perceived themselves professionally (Table 8).

Table 8 - Personal benefits that influence participation (n=97)

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
<th>Disagree²</th>
<th>Agree³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expands my professional network</td>
<td>4.2</td>
<td>0.7</td>
<td>3%</td>
<td>88%</td>
</tr>
<tr>
<td>Affords opportunity to share “insider” knowledge</td>
<td>4.0</td>
<td>0.8</td>
<td>3%</td>
<td>77%</td>
</tr>
<tr>
<td>Helps answer complex questions about my practice that I could not easily solve alone</td>
<td>3.7</td>
<td>1.0</td>
<td>11%</td>
<td>62%</td>
</tr>
<tr>
<td>Sharing knowledge in an online simulation community will lead to direct benefits for me</td>
<td>3.6</td>
<td>0.9</td>
<td>12%</td>
<td>59%</td>
</tr>
<tr>
<td>Influences how I perceive my professional identity</td>
<td>3.2</td>
<td>1.0</td>
<td>19%</td>
<td>43%</td>
</tr>
</tbody>
</table>

¹Five-point Likert scale from strongly disagree to strongly agree
²Both agree and strongly agree
³Both disagree and strongly disagree

Aggregated as a scale, personal benefits had a mean score of 3.7 ($SD = 0.6$) on a five-point scale. Results from the ANOVA revealed that there was a significant difference among the never, rarely, and often participate groups, ($F(2,95) = 7.8, p < 0.05$). A Tukey’s post hoc analysis indicated that those who often posted ($M=4.0, SD=0.5$) scored significantly higher
in perceived personal benefits than those who rarely posted ($M=3.6, SD=0.7, p < 0.05$) and who never posted ($M=3.5, SD=0.5, p < 0.05$). No other post hoc comparisons were significant.

4.2.3.2 Open-ended Survey Questions

Thirty-seven comments from the open-ended survey related to the personal benefits that respondents reported as factors for participation. Most comments (76%) pertained to enabling factors such as having the ability to network and problem solve with some of the best minds in the field. There was also a perceived benefit of using online simulation communities as a resource to spark innovation. However, some respondents reported seeing a lack in personal benefits as a barrier to participation (24%). Common barriers included respondents feeling that the quality of content posted can be low, particularly when there is too much content geared towards novices. Table 9 highlights representative comments that relate to personal benefits.

Table 9 – Personal Benefits and Participation ($n=37$)

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Sample Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enablers ($n=28$)</td>
<td>“The online community offers a connection to the simulation community that is not available in my rural community”</td>
</tr>
<tr>
<td></td>
<td>“I feel more likely to engage in online communication when I have a question for which I can't find the answer - I feel confident someone in the community will be able to answer it.”</td>
</tr>
<tr>
<td></td>
<td>“This is a growing and rapidly changing field-ilitating [sic] feedback from others is an important aspect of my administration.”</td>
</tr>
<tr>
<td>Barriers ($n=9$)</td>
<td>“I look at online communities like [I] look at magazines. Some interesting articles. Lots of ‘ads’ trying to sell their products or ideas. There are the 'experts' that [sic] feel that they need to have an article every month...”</td>
</tr>
<tr>
<td></td>
<td>“Otherwise general content, for people that have been in the...”</td>
</tr>
</tbody>
</table>
community for some time, there is a sense of the same content being retold over and over again.”

4.2.3.3 Semi-structured Interviews

When asked about what motivated them to participate in online communities, interviewee responses supported the survey data especially with regard to valuing the ability to solve complex problems and build a professional network. Interviewee 2 appreciated having access to representatives from equipment manufacturers:

“There are a number of people who have a lot of experience with their [Laerdal’s] mannequins. And their tech service also monitors the posts, so if you post a question that has a tech support kind of answer, it’s not uncommon to get an official answer.”

Interviewee 3 expanded on the professional networking theme, indicating that online communities may contribute to a broadening of collective perspective:

“The list allowed us to over time see the people that were contributing that we might not have known about because they were in the middle of Ohio somewhere... You know, I think that served to enhance the democratization of our field because anybody could speak to anybody.”

All but one interviewee (80%) agreed that online communities contributed to their perception of professional identity. Interviewee 4 shared that online communities were a gateway into professional committee work. Interviewee 2 added that an enhanced sense of professional identity came only after more utilitarian considerations:
“Initially when I got started with it, it was primarily that I would have access to the best brains my profession. Then the secondary piece that showed up that appealed to me was that I had a place in my profession to contribute, and that over time has become the primary driver.”

Interviewees were also specifically probed about whether having novice users and content in a community makes it less likely for them to participate (a theme noted in the open-ended survey responses). None of the interviewees reported sharing this viewpoint. Interviewee 1 reported the opposite position, noting a feeling of obligation to respond.

“I feel obligated to address novice questions – everyone has to start somewhere. Those that are annoyed by novice questions might be burnt out, lost [their] passion for education.”

Interviewee 3 saw novice content posted to the community as an exciting opportunity to watch emerging leaders help their less experienced peers.

4.2.4 Trust in Community

4.2.4.1 Likert Questions

Just over 90% of respondents reported that online simulation communities are an efficient way to share knowledge. Almost three-quarters of respondents agreed that their professional values align with those of the communities in which they participate. Two-thirds of respondents reported trusting in the reciprocity of the community, while just over half reported that their participation rate is affected by their trust in the community’s moderators (Table 10).
Table 10: Trust in Community Factors that Influence Participation (n=97)

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>An efficient way to share knowledge</td>
<td>4.2</td>
<td>0.7</td>
<td>1%</td>
<td>91%</td>
</tr>
<tr>
<td>My professional values align with those of the online simulation communities</td>
<td>3.9</td>
<td>0.7</td>
<td>3%</td>
<td>72%</td>
</tr>
<tr>
<td>Makes it more likely that my own questions will be addressed</td>
<td>3.7</td>
<td>0.7</td>
<td>4%</td>
<td>64%</td>
</tr>
<tr>
<td>Trusting the good intentions of online community moderators affects participation</td>
<td>3.5</td>
<td>0.8</td>
<td>8%</td>
<td>54%</td>
</tr>
</tbody>
</table>

1Five-point Likert scale (strongly disagree to strongly agree)
2Both agree and strongly agree
3Both disagree and strongly disagree

Aggregated as a scale, trust in community had a mean of 3.8 (SD = 0.5) on a five-point scale. Results from the ANOVA revealed that there was a significant difference among the never, rarely, and often participate groups (F(2,94) = 0.9, p < 0.05). A Tukey’s post hoc analysis indicated that those who posted often (M=4.0, SD=0.5) scored significantly higher in their trust of community than those who never posted (M=3.7, SD=0.6, p < 0.05). No other post hoc comparisons were significant.

4.2.4.2 Open-ended Survey Questions

There were fifteen comments collected on the open-ended survey that related to trust in virtual communities. Six respondents reported that their participation was related to perceptions of professional alignment with the values of the community. Another enabling factor was trusting in the scholarly and open nature of a community, which is free of both knowledge hoarding and the protection of proprietary interests.

Ten of the comments collected related to trust factors that act as a barrier to participation. One comment specifically addressed the perception of knowledge hoarding by competing organisations. Three of the barrier comments addressed a perception of
cultural bias in the communities. Also reported were feelings of professional misalignment with the community (e.g., feelings that the content is too physician-centred versus other health professions) and a perception that untrustworthy community moderation makes participation less likely. Table 11 highlights representative comments that relate to trust in community.

*Table 11 – Trust in Community as an Enabler and Barrier (n=16)*

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Sample Comments</th>
</tr>
</thead>
</table>
| Enablers (n=6)  | “Simulation communities seem very willing and enthusiastic to share among themselves. It is not ‘territorial’ like faculty knowledge; in other words, I don’t feel like community members withhold information so they can be the first to publish.”  
“Perception of value and scholarly nature of the online community in question” |
| Barriers (n=10) | “I am most likely to quit accessing or participating in a community if there is not some kind of moderation, so that there is low-value communication, such as chat, sales pitches, or circular arguments.”  
“I think that communities about simulations do not involve all countries”  
“Hoardring of information and competition between programs is a major barrier to participation. Many simulation programs feel that they need to keep their workflows and knowledge proprietary so that they can maintain a competitive advantage.”  
“Dislike of leaving a digital footprint that can be used or twisted by others.” |
4.2.4.3 Semi-structured Interviews

Interview responses related to trust in the community clarified and added nuance to the open-ended survey question responses. Interviewee 1 commented that mistrust with the moderation process of a LinkedIn community was a problem:

“I’d say that they completely lack moderation, and one feature that really bugs me is that many of them, because they’re not moderated, either people who it’s hard to tell whether they represent a particular business entity and they’re pushing their view of things or their products, or they’re overt and they’re using that forum to actively push their product or system or whatever it is.”

Interviewee 1 went on to contrast these feelings of mistrust with a sense of professional alignment in more structured and moderated communities:

“I like them because I think people try to appear and maintain their professional status so they’re very careful that their information is true, it’s accurate, and at least a good portion of people will disclose if they have some sort of interest. They still will push whatever they’re pushing, but at least they self-disclose.”

Interviewee 3 expanded on the theme of trusting in the professional nature of simulation communities by contrasting them with general online communities, noting that discussions tended to get less heated and, that, “the focus is on professional issues rather than chitchat.”

Interviewees were specifically probed about their perceptions of simulation communities being open and forthcoming versus protecting proprietary intellectual property. Interviewee 2 expressed that online simulation communities tended to be very
open about sharing content, perhaps because many simulation programs were only regionally competitive, which means that they were more open to sharing with distant programs that they interact with online. Interviewee 3 believed that protecting proprietary interests was more prevalent in for-profit simulation programs:

“I think that [protectionism] comes up much more often in the hospital based programs, or programs that charge for their training. If they’ve developed an expensive simulation program and they’ve put their engineers into figuring out all of the information and material, then to hand that over is many, many paid work hours that a competitive group might be able to use to run a program that might directly impact people signing up for yours.”

4.2.5 Workplace Support

4.2.5.1 Likert Questions

A majority of respondents (70%) agreed that their workplace management were aware of knowledge sharing practices in online communities. Just over half (55%) reported that their workplace management actively promoted participation in online simulation communities, while just over one-in-five disagreed (Table 12).

Table 12: Workplace Support Factors that Influence Participation (n=97)

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My workplace management are aware of the benefits of knowledge sharing</td>
<td>4.0</td>
<td>1.2</td>
<td>14%</td>
<td>70%</td>
</tr>
<tr>
<td>My workplace management actively promotes knowledge sharing</td>
<td>3.6</td>
<td>1.3</td>
<td>21%</td>
<td>55%</td>
</tr>
</tbody>
</table>

1Five-point Likert scale from strongly disagree to strongly agree
2Both agree and strongly agree
3Both disagree and strongly disagree

Aggregated as a construct, workplace support had a mean score of 3.8 (SD = 1.1) on a five-point scale. Results from the ANOVA revealed that there were no significant
differences among the never, rarely, and often participate groups with respect to how much posting in virtual communities was supported by management in the workplace \(F(2, 93) = 1.6, \text{ns.}\).

4.2.5.2 Open-ended Survey Questions

Five comments related to workplace support for participating in virtual communities emerged from the surveys. All comments referenced a lack of workplace support, with most noting that their management did not recognise virtual community participation as legitimate scholarly activity. One respondent noted that, “there is no recognition that this type of engagement is collaboration with your academic peers much like in a physical community.” Another respondent referenced hospital IT policies that blocked access to virtual communities as a workplace support barrier.

4.2.5.3 Semi-structured Interviews

When asked about their organisation’s stance on participating in virtual communities, interview participants reported mixed perspectives. Some organisations actively promoted sharing in virtual communities, as they perceived a positive benefit in building brand awareness (Interviewees 2 and 3) and participating in scholarship (Interviewee 3). However, Interviewee 1 reported an organisational point of view that is keen on the benefits of receiving information, but not with sharing:

“My organisation doesn’t have a clue about social media, and they hate it, and they don’t think it’s valuable at all, zero. But they will tell you that I’m the person that’s feeding them everything, that that is helping them form a picture of where we need to go and where we’re at and what we’re doing or not doing. So they’ll be the first ones to tell you that they’re getting it from me, and they recognise that I’m getting it from
these venues. But when I talk to them about building our own feeds or, you know, tweeting, or doing stuff like that they’re just, forget it, they hate it, they don’t want to have anything to do with it. They really want to take information. They like the taking and they like the strategic push, but they don’t want to put anything out there.”

Interviewee 4 worked at a community college where scholarship and knowledge-sharing were not a top priority of the administration. Interviewee 5 stated that the organisation’s main concern was meeting project deliverables, potentially at the expense of sharing information and best practices in online communities:

“Because there are really laid out deliverables that have to be met by the end of the fiscal year, it’s like you know, ‘... I do care if you spend an hour networking with other people if it’s going to take away from that hour that needs to be spent on meeting my deliverables’.”

4.2.6 Self-efficacy

4.2.6.1 Likert Questions

Just over 80% of respondents reported feeling that the uniqueness of their personal experience added value to potential contributions they made to online communities. Nearly 70% felt confident in their ability to contribute valuable content (Table 13).

Table 13: Self-efficacy Factors that Influence Participation (n=97)

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The uniqueness of my personal experience in adds value to what I am able to contribute</td>
<td>4.1</td>
<td>0.7</td>
<td>1%</td>
<td>82%</td>
</tr>
<tr>
<td>I am confident in my ability to contribute valuable content</td>
<td>3.8</td>
<td>0.9</td>
<td>8%</td>
<td>68%</td>
</tr>
</tbody>
</table>

1Five-point Likert scale from strongly disagree to strongly agree
2Both agree and strongly agree
3Both disagree and strongly disagree
The aggregate self-efficacy scale had a mean score of 3.9 ($SD = 0.7$) on a five-point scale. Results from the ANOVA revealed that there was a significant difference among the never, rarely, and often participate groups, ($F(2,94) = 10.2, p < 0.05$). A Tukey’s post hoc analysis indicated that those who posted often ($M=4.2, SD=0.5$) scored significantly higher on self-efficacy than those who rarely ($M=3.9, SD=0.7, p < 0.05$), or never posted ($M=3.5, SD=0.7, p < 0.05$). No other post hoc comparisons were significant.

4.2.6.2 Open-ended Survey Questions

Twelve comments emerged from the open-ended surveys that were related to how respondents’ perception of self-efficacy influenced participation. There were an equal number of enablers and barriers. The common theme that emerged from the enabling aspects of self-efficacy was that respondents felt that they had the required expertise to contribute. One response referenced feeling professionally obligated to participate. Reports of barriers centred on perceptions of not being experienced enough in the simulation field to participate (Table 14).

Table 14 – Self-efficacy as an Enabler and Barrier ($n=12$)

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Sample Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enablers ($n=6$)</td>
<td>“I feel very comfortable with simulation and that I may be able to help others with my posts.”</td>
</tr>
<tr>
<td></td>
<td>“Because of my position within certain groups, I feel I have an obligation to participate.”</td>
</tr>
<tr>
<td></td>
<td>“[I have] experience in my field [and] expertise to contribute.”</td>
</tr>
<tr>
<td>Barriers ($n=6$)</td>
<td>“Lack of experience.”</td>
</tr>
<tr>
<td></td>
<td>“Still determining if my level of expertise warrants sharing.”</td>
</tr>
</tbody>
</table>
4.2.6.3 Semi-structured Interviews

Interview participants expanded on the theme of self-efficacy and participation. Interviewee 2 reflected on the multi-disciplinary nature of simulation communities and how comfort in one domain did not necessarily translate to others:

“So as a simulation technician, I’m comfortable commenting about the technology, the scenarios, how to develop them, how to make them run and how to debrief them. But as far as making it fit into nursing curriculum content, I really stay away from there because it’s really a bit of a minefield because I don’t have that credential.”

Interviewee 1 reflected that communities with active users who had a high sense of self-efficacy have have inhibited alternative perspectives:

“I’ve noticed that if someone with an authoritative stance says something and it’s very content-rich, that is it. You’re lucky to get one more response to that. And so I like to see, before I say anything, will the conversation start? Will people start contributing pieces? Because if they do, you might get perspectives in there that you might not otherwise get.”

When probed specifically about what made them comfortable to move from an observer role to an active participation role, most interviewees noted variations on feeling qualified enough to address specific questions. Interviewee 5 reported positive feelings of being able to contribute despite initial feelings of being a novice:

“I’ve done some research in the area already working in curriculum development... but I felt like I was only scratching the surface. But in actuality, when I joined the community of practice... the material that was presented wasn’t drastically different from what I was already reading. So I was actually pretty well-versed... I was like this is all stuff I already know. But that just made me feel better about myself because I was like ‘oh, maybe I can actually get started.’”
4.2.7 Psychological Safety

4.2.7.1 Likert Questions

Just over half of respondents reported that they were not concerned about their level of competence being judged when posting. However, nearly one-third stated that they were concerned. A minority of participants (11%) agreed that they were concerned about appearing to be immodest when offering their point of view (Table 15).

Table 15: Psychological Safety Factors that Influence Participation \( (n=97) \)

<table>
<thead>
<tr>
<th>Question</th>
<th>( M )</th>
<th>( SD )</th>
<th>Disagree(^2)</th>
<th>Agree(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am concerned that my level of competence will be judged by others</td>
<td>2.7</td>
<td>1.1</td>
<td>55%</td>
<td>30%</td>
</tr>
<tr>
<td>I am concerned that offering my point of view or experience will be perceived as immodest</td>
<td>2.4</td>
<td>0.8</td>
<td>57%</td>
<td>11%</td>
</tr>
</tbody>
</table>

\(^1\)Five-point Likert scale from strongly disagree to strongly agree  
\(^2\)Both agree and strongly agree  
\(^3\)Both disagree and strongly disagree

Aggregated as a scale and reverse-coded to measure a positive attitude, the mean psychological safety score was 3.5 \( (SD = 0.9) \) on a five-point scale. Results from the ANOVA revealed that there was a significant difference among the never, rarely, and often participate groups, \( (F(2,94) = 7.2, p < 0.05) \). A Tukey’s post hoc analysis indicated that those who posted often \( (M=3.8, SD=0.9) \) scored significantly higher on feeling psychologically safe than those who never posted \( (M=3.0, SD=0.8, p < 0.05) \). No other post hoc comparisons were significant.

4.2.7.2 Open-ended Survey Questions

Four comments from the open-ended surveys were related to how feelings of psychological safety related to participation. There were two reports of enablers, including
feeling outgoing and not afraid to ask questions, along with a sense of comfort in shared experience:

“Well those in sim environment often experience similar problems and as a direct result [I] feel comfortable approaching others in like situations.”

There were also two barrier comments including not wanting to be judged, and, “some fear or anxiety that others will think my idea’s [sic] are stupid or not effective.”

4.2.7.3 Semi-structured Interviews

While interviewees were not asked specifically about their perception of psychological safety within online simulation communities, Interviewee 3 offered a perspective on how the role of moderator was used to support psychological safety in one community:

“It became clear over time that it would be better for everybody - it would be more comfortable, there would be less opportunity for embarrassment - if I continued to stay as the moderator... I have occasionally had to say, ‘are you sure you want to share this? This is not a pleasant tone. I think it’s argumentative... I’m going to wait a day and check back in with you, and if this is really what you want to send out we’ll send it out’.”

4.3 Content Assessment

4.3.1 Effortful Evaluation

4.3.1.1 Likert Questions

Over three-quarters of respondents agreed that they tried to distinguish fact from opinion when assessing online content. Just over half considered the motivations of the
person who made the post and about 40% agreed that they made an active effort to verify the accuracy of content (Table 16).

Table 16: Non-heuristic, effortful evaluation summary (n=97)

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I attempt to establish whether the post constitutes fact vs. opinion</td>
<td>3.8</td>
<td>0.7</td>
<td>5%</td>
<td>77%</td>
</tr>
<tr>
<td>I consider the motivations of the person who made the post</td>
<td>3.5</td>
<td>1.0</td>
<td>16%</td>
<td>53%</td>
</tr>
<tr>
<td>I make an active effort to verify the accuracy of the content</td>
<td>3.3</td>
<td>0.9</td>
<td>21%</td>
<td>44%</td>
</tr>
</tbody>
</table>

1 Five-point Likert scale from strongly disagree to strongly agree
2 Both agree and strongly agree
3 Both disagree and strongly disagree

4.3.1.2 Open-ended survey questions

Fourteen comments gathered from the open-ended survey questions demonstrated evidence of non-heuristic, effortful practices of content assessment. The common effortful practice that emerged is evaluating content based on its scientific merit, from an analysis of supporting peer-reviewed literature and an interpretation of validity and reliability. Sample comments included:

“Whether the knowledge is evidence-based.”

“The information is evidence based and will resolve or correct some thinking in my department that is incorrect.”

“If the knowledge is... the conclusion of research or a logical argument.”
4.3.2 Reputation Heuristic

4.3.2.1 Likert Questions

When assessing the credibility of content, both the poster's explicit credentials and perceived reputation in the community were an important factor for just over half of the respondents (Table 17). Aggregated as a scale, the reputation heuristic had a mean score 3.4 ($SD = 0.9$) on a five-point scale.

Table 17: Reputation Heuristic Summary ($n=97$)

<table>
<thead>
<tr>
<th>Question</th>
<th>$M$</th>
<th>$SD$</th>
<th>Disagree$^2$</th>
<th>Agree$^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>The credentials of who made the post are an important factor</td>
<td>3.4</td>
<td>1.0</td>
<td>22%</td>
<td>57%</td>
</tr>
<tr>
<td>The poster's reputation in the community is an important factor</td>
<td>3.4</td>
<td>1.0</td>
<td>21%</td>
<td>52%</td>
</tr>
</tbody>
</table>

$^1$Five-point Likert scale from strongly disagree to strongly agree
$^2$Both agree and strongly agree
$^3$Both disagree and strongly disagree

4.3.2.2 Open-ended Survey Questions

Twelve responses from the open-ended survey questions demonstrated evidence of reputation being used for content evaluation. Ten of the responses indicated that a poster’s reputation has a positive influence on credibility assessment, including this representative comment:

“The position and credentials of the person who is posting [are important]. At the risk of sounding arrogant, I place much more value in a posting from someone who has advanced credentials than I do from someone who does not have such credentials. To me, advanced credentials indicate a deeper level of knowledge in more areas than what is being discussed.”
Two of the comments indicated that a poster’s reputation can have a detrimental effect to credibility assessment. One respondent was particularly sceptical of individuals who were condescending or self-aggrandizing:

“Aggressive and condescending language, or a ‘greater than thou’ attitude, result in the poster instantly losing credibility, regardless of how accurate and helpful the post really is.”

Another respondent noted, “the longer the signature, the less I trust it.”

4.3.3 Endorsement Heuristic

4.3.3.1 Likert Questions

Nearly three-quarters (72%) of respondents agreed that seeing a post endorsed by the community made it more likely that they would find it to be credible, while 4% disagreed. The mean endorsement heuristic score was 3.8 ($SD = 0.7$) on a five-point scale.

4.3.3.2 Open-ended Survey Questions

Six comments from the open-ended surveys indicated that the endorsement heuristic was used to evaluate online content. The context for endorsement centred on trusting community consensus when seeking solutions to specific problems, as demonstrated by two representative comments. For example, one respondent noted, “I would say that if a number of people agree with a post or say they have tried it and it worked, I would be much more likely to incorporate it.” Another stated, “I think the number of people who respond with similar solutions... has an impact on my decision making.”
4.3.4 Self-confirmation Heuristic

4.3.4.1 Likert Questions

Just over 80% of respondents reported that they found posts to be credible if they made intuitive sense. Over three-quarters trusted posts when they aligned with their own experience (Table 18). The aggregated mean self-confirmation heuristic score was 3.9 (SD = 0.6) on a five-point scale.

Table 18: Self-confirmation Heuristic Summary (n=97)

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
<th>Disagree(^2)</th>
<th>Agree(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I tend to trust the credibility of a post in an online simulation community if it makes intuitive sense to me</td>
<td>3.9</td>
<td>0.6</td>
<td>3%</td>
<td>81%</td>
</tr>
<tr>
<td>I tend to trust the credibility of a post in an online simulation community if it falls in line with my own experience</td>
<td>3.9</td>
<td>0.7</td>
<td>3%</td>
<td>76%</td>
</tr>
</tbody>
</table>

\(^1\)Five-point Likert scale from strongly disagree to strongly agree  
\(^2\)Both agree and strongly agree  
\(^3\)Both disagree and strongly disagree

4.3.4.2 Open-ended Survey Questions

Twenty-one responses to the open-ended survey questions demonstrated evidence of participants using the self-confirmation heuristic. Most comments were related to valuing content that aligns with prior experience, education, and local practices. Sample comments from respondents indicated that they would trust the information if,

“it makes sense and seems in line with the current knowledge I have acquired as a CHSE [Certified Healthcare Simulation Educator].”

“[The knowledge] seems congruent with other knowledge I have received.”

“[The content] is posted by other nurses.”
4.3.5 Expectancy Violation Heuristic

4.3.5.1 Likert Questions

Nearly seven out of ten respondents were more likely to trust content when they perceived the design and interface of the community platform to be professional. Two-thirds of the respondents noted that they do not trust content with poor grammar. Just over one-half claimed that they were less likely to trust posts with poor spelling (Table 19). Aggregated as a scale, the mean expectancy violation heuristic score was 3.7 ($SD = 0.8$) on a five-point scale.

Table 19: Expectancy Violation Heuristic Summary (n=97)

<table>
<thead>
<tr>
<th>Question</th>
<th>$M$</th>
<th>$SD$</th>
<th>Disagree $^2$</th>
<th>Agree $^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am more likely to trust content posted in an online simulation community if the design and interface are professional</td>
<td>3.8</td>
<td>0.9</td>
<td>7%</td>
<td>69%</td>
</tr>
<tr>
<td>If I see a post in an online simulation community that contains poor grammar, it makes me less likely to trust the content</td>
<td>3.8</td>
<td>0.9</td>
<td>8%</td>
<td>66%</td>
</tr>
<tr>
<td>If I see a post in an online simulation community that contains incorrect spelling, it makes me less likely to trust the content</td>
<td>3.5</td>
<td>0.9</td>
<td>15%</td>
<td>53%</td>
</tr>
</tbody>
</table>

$^1$Five-point Likert scale from strongly disagree to strongly agree  
$^2$Both agree and strongly agree  
$^3$Both disagree and strongly disagree

4.3.5.2 Open-ended Survey Questions

Four responses to the open-ended survey questions demonstrated evidence of the use of the expectancy-violation heuristic. Three comments referenced valuing content that appears professional, including,

“if the knowledge is presented in a professional manner.”
“if the post is legible... I am likely to consider following the suggestion.”

One comment specifically referenced valuing multimedia elements, disregarding,

“short answer[s]... answers[s] without videos or pics.”

4.3.6 Persuasive Intent Heuristic

4.3.6.1 Likert Questions

Nearly two-thirds (64%) of respondents agreed with utilising the persuasive intent heuristic when evaluating the credibility of content, while 4% disagreed. The mean score for the persuasive intent heuristic was 3.9 (SD = 0.9) on a five-point scale.

4.3.6.2 Open-ended Survey Questions

Four comments from the open-ended survey questions demonstrated evidence of the use of the persuasive intent heuristic when evaluating the credibility of content. Three of the comments were focused on the financial interest of content poster, as exemplified here:

“[I value] the lack of apparent financial or personal gain from posting the information. If I am engaging in a debate and a person with potential gain begins to weigh in - I withdraw from the conversation.”

One comment generalised the association of lack of credibility and financial interest to the content platform:

“The credibility of the organization and vehicle it uses to post the information. For example, the INACSL [International Nursing Association for Clinical Simulation and Learning] on LinkedIn often contains posts about things that the poster may benefit from financially, or the topic is information light... I find I have a skeptical attitude toward any post within this organization via LinkedIn.”
### 4.3.7 Interaction Among Heuristics

#### 4.3.7.1 Likert Question Correlations

There were multiple instances of specific cognitive heuristics being moderately correlated with each other, which indicated that survey respondents often used more than one heuristic to evaluate content (Table 20). Most notably, *self-confirmation* was significantly and positively correlated with every other heuristic. *Reputation* was significantly and positively correlated with every heuristic except for *persuasive intent*, and *endorsement* was significantly and positively correlated with every other heuristic except for expectancy violation.

*Table 20: Inter-heuristic Correlations (Spearman’s rho)*

<table>
<thead>
<tr>
<th></th>
<th>Reputation</th>
<th>Endorsement</th>
<th>Self-confirmation</th>
<th>Expectancy Violation</th>
<th>Persuasive Intent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reputation</td>
<td>1.00</td>
<td>0.30**</td>
<td>0.28**</td>
<td>0.27**</td>
<td>0.13</td>
</tr>
<tr>
<td>Endorsement</td>
<td>1.00</td>
<td>0.60**</td>
<td>0.15</td>
<td>0.22*</td>
<td></td>
</tr>
<tr>
<td>Self-confirmation</td>
<td>1.00</td>
<td>0.24*</td>
<td>0.31**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expectancy Violation</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td>0.18</td>
</tr>
<tr>
<td>Persuasive Intent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

* * p < 0.05 (2-tailed)
** p < 0.01 (2-tailed)

The Likert question “I make an active effort to verify the accuracy of content”, an indicator of effortful evaluation, was significantly and negatively correlated with the *endorsement* heuristic ($r=-0.30$, $p<0.01$), but not with any other heuristic. This suggests that respondents did not engage in simultaneous heuristic and effortful assessment.
However, the two other Likert questions that assessed the use of effortful evaluation were significantly and positively associated with at least one heuristic. The Likert question “I attempt to establish whether the post constitutes fact versus opinion” was significantly and positively correlated with the *expectancy violation* heuristic ($r=0.37$, $p<0.01$). Also, the Likert question “I consider the motivations of the person who made the post” was significantly and positively correlated with the *expectancy violation* ($r=0.31$, $p<0.01$), *reputation* ($r=0.23$, $p<0.05$), and *persuasive intent* heuristics ($r=0.23$, $p<0.05$).

### 4.3.7.2 Semi-structured Interview Questions

The interviews added insight into the use of multiple heuristics, as well as cases of simultaneous effortful evaluation. When asked to outline how they evaluate the credibility and value of content, interviewees all demonstrated evidence of using a multi-step strategy that incorporated more than one heuristic. In most cases (60%), heuristics were used in conjunction with effortful evaluation, though effortful evaluation was never the first strategy. The *reputation* heuristic was used by all but one interviewee and was the first heuristic referenced in 60% of cases. Table 21 summarises the multi-step assessment process for each interviewee.
Table 21: Multi-step Content Evaluation Practices (n = 5)

<table>
<thead>
<tr>
<th>Sample comments</th>
<th>Heuristics used (in order)</th>
</tr>
</thead>
</table>
| "The first thing I want to know is who is it that actually posted [the content]. So I’ll go and I’ll actually look. Is there an obvious connection... to a proprietary business? Is the person who is posting it trying to hide that they’re connected to a proprietary business? Then I’ll look for the science and I’ll put a critical eye towards that science as well in terms of evaluating if they have any statistics, their approach, things that they might not have considered."  (Interviewee 1) | Reputation
Persuasive intent
Effortful evaluation |
| "It’s rather intuitive if you read something to go ah, I don’t think that will work or won’t work for us and then you just don’t try it, but if it’s a well thought out post or modification or something like to a mannequin or a procedure then you can walk through it and see whether it’s going to work or not."  (Interviewee 2) | Self-confirmation
Effortful evaluation |
| "The number one way that I evaluate the trustworthiness of the content that is posted is through my own experience because I’ve been in the field for over 20 years now so I run it through my own filter first. Obviously the second thing is who is posting. I know most of the players now, I have my opinions about people’s... not only the people themselves but the lens that they use to look at things and the lens through which they work, so I definitely take that into account.”  (Interviewee 3) | Self-confirmation
Reputation |
| If it’s something that’s just flat ‘hey we tried this thing’, their credentials matter, the way that they put their idea forward matters. I’m subject, for better or for worse... to people’s use of language, and that includes grammar and all that kind of stuff. I mean it’s a little bit like, again, it’s almost like a published piece of work... I evaluate it in the same way. And then I evaluate it as to whether I experientially and intellectually think it’s valid. So, I weigh it against my own experience, I weigh it against what just make sense.”  (Interviewee 4) | Reputation
Expectancy violation
Self-confirmation |
| “So if I were to receive [content from a trusted source], I’d probably read it and then I’d probably want to... leave the actual email itself and dig a little deeper... So let’s say it was posted in [the community] - I would probably read it directly from the website and then if it was possible for me to, like if I thought the new idea that they had was really cool and innovative I might dig a little further in terms of searching either this person or their organization online to see what other kinds of things they were doing just to sus it out a bit more, and then I don’t know, in terms of getting any red flags - if it looked more like a marketing ploy.”  (Interviewee 5) | Reputation
Effortful evaluation
Persuasive intent |
4.4 Summary

4.4.1 Participation Factors

Table 22 summarises the salient findings from the participation factors researched in this study.

Table 22: Summary of Participation Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean</th>
<th>SD</th>
<th>Enabler Comments</th>
<th>Barrier Comments</th>
<th>ANOVA Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of using interface (1 item)</td>
<td>4.2</td>
<td>0.9</td>
<td>6</td>
<td>9</td>
<td>Often &gt; never</td>
</tr>
<tr>
<td>Comfort with technology (1 item)</td>
<td>3.4</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>Not significant</td>
</tr>
<tr>
<td>Time (1 item)</td>
<td>3.1</td>
<td>1.2</td>
<td>5</td>
<td>29</td>
<td>Not significant</td>
</tr>
<tr>
<td>Personal benefits (5 items)</td>
<td>3.7</td>
<td>0.6</td>
<td>29</td>
<td>9</td>
<td>Often &gt; rarely and never</td>
</tr>
<tr>
<td>Trust in community (4 items)</td>
<td>3.8</td>
<td>0.5</td>
<td>6</td>
<td>10</td>
<td>Often &gt; never</td>
</tr>
<tr>
<td>Workplace support (2 items)</td>
<td>3.8</td>
<td>1.1</td>
<td>0</td>
<td>5</td>
<td>Not significant</td>
</tr>
<tr>
<td>Self-efficacy (2 items)</td>
<td>3.9</td>
<td>0.7</td>
<td>6</td>
<td>6</td>
<td>Often &gt; rarely and never</td>
</tr>
<tr>
<td>Psychological safety (2 items)</td>
<td>3.5</td>
<td>0.9</td>
<td>2</td>
<td>2</td>
<td>Often &gt; never</td>
</tr>
</tbody>
</table>

1 Five-point Likert scale (strongly disagree to strongly agree)
2 Community posting frequency (often, rarely, never)

4.4.2 Content Assessment

Table 23 summarises the salient findings from the use of cognitive heuristics researched in this study.
<table>
<thead>
<tr>
<th>Heuristic</th>
<th>Mean</th>
<th>SD</th>
<th>Comments</th>
<th>Correlated With</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reputation (2 items)</td>
<td>3.4</td>
<td>0.9</td>
<td>12</td>
<td>Endorsement, self-confirmation, expectancy violation</td>
</tr>
<tr>
<td>Endorsement (1 item)</td>
<td>3.8</td>
<td>0.7</td>
<td>6</td>
<td>Reputation, self-confirmation, persuasive intent</td>
</tr>
<tr>
<td>Self-confirmation (2 items)</td>
<td>3.9</td>
<td>0.6</td>
<td>21</td>
<td>Reputation, endorsement, expectancy violation, persuasive intent</td>
</tr>
<tr>
<td>Expectancy violation (3 items)</td>
<td>3.7</td>
<td>0.8</td>
<td>4</td>
<td>Reputation, self-confirmation</td>
</tr>
<tr>
<td>Persuasive intent (1 item)</td>
<td>3.9</td>
<td>0.9</td>
<td>4</td>
<td>Endorsement, self-confirmation</td>
</tr>
</tbody>
</table>

1Five-point Likert scale (strongly disagree to strongly agree)
5 Discussion

5.1 Overview

This study was a formative analysis of virtual communities of practice in simulation-based healthcare education. Three research questions were addressed:

1. To what degree do users participate in simulation virtual communities?
2. What factors influence user participation in simulation virtual communities?
3. To what extent are cognitive heuristics employed by users of simulation virtual communities to assess the value and credibility of content?

5.2 Participation Frequency

5.2.1 Community Participation Frequency Analysis

Results of the participation frequency analysis demonstrated that self-hosted forums representing healthcare simulation communities had more robust participation than LinkedIn groups. While LinkedIn groups had a relatively high number of posts per day, not much conversation was being generated by those posts. The LinkedIn groups with the highest level of engagement saw approximately a third of new threads being replied to and never averaged over two replies per thread. By contrast the level of engagement with the self-hosted forums averaged more than two replies per thread and more than half of all new threads were replied to.

The qualitative data collected in this study may offer some explanation for the limited engagement in LinkedIn groups. Comments from the open-ended survey questions and interviews suggest that some participants are sceptical of the quality and credibility of
content posted on LinkedIn. This scepticism seemed to be driven not only by the content itself but by the commercial nature of the platform.

Based on the low engagement rate, it is worth considering whether LinkedIn groups in simulation-based healthcare education constitute authentic communities of practice. Wenger (1998) stated that a community of practice is more than a structure or a platform, that it is defined by professionals seeking to learn from each other and growing their sense of embeddedness. From that perspective, one could make the argument that the LinkedIn groups included in this study were not legitimate CoPs.

The one community that required a paid membership (Society for Simulation in Healthcare SimConnect) had very robust participation metrics. Although two survey comments specifically referenced paid memberships as a barrier, the high level of participation observed in the community suggests that money is a barrier for the minority of users. Future research might focus on how having payment as a gatekeeper mediates community engagement. For example, it is possible that users feel compelled to extract value from payment and are more likely to participate.

It is worth noting that this study examined participation metrics only and did not assess the nature and relative quality of content. For example, it was not established whether commercial posts were more prevalent in LinkedIn groups versus forums, as observed by some study participants. Future research into developing a scale to systematically assess the nature of content and overall robustness of VCoPs would be a useful contribution to the field. Scales such as those developed by Kay and Knaack (2009) and Kay (2011) to assess online learning tools could be used as a methodological starting point.
Participants in this study reported passive observation in simulation education VCoPs at a much higher frequency than active participation. Almost 80% of participants reported reading posts once per week or more. By contrast, only 20% of the participants reported posting once per week or more, and 20% reported never posting at all. The prevalence of passive observation is consistent with the theoretical framework of communities of practice, which predicts that engagement starts with peripheral observation and eventually progresses to frequent, expert contribution as perceptions of self-efficacy and alignment with community values increase over time (Wenger et al., 2002).

5.3 Participation Factors

5.3.1 Platform Ease of Use and Comfort with Technology

In this study, there was strong agreement that a virtual community’s platform ease of use affected participation. In addition active participants valued ease of use significantly more than non-participants did. These results are consistent with the Technology Acceptance Model (Davis, 1989), as well as multiple studies of virtual communities in the literature (Ardichvili et al., 2003; Gupta & Kim, 2008; Harrison & Daly, 2009; Lai et al., 2014).

What is less clear is how respondents’ general comfort level with technology affected participation. It was predicted that platform ease of use and comfort with technology would form a single construct, as reported in some studies (Harrison & Daly, 2009; Lai et al., 2014), but a reliability analysis demonstrated that these were independent factors in this study. This inconsistency is evident by looking at the descriptive statistics, as almost 90% of respondents rated ease of use to be a factor that influenced their participation.
whereas only half rated comfort with technology as a factor that influenced participation. It is possible that the general technology involved with VCoPs was simple enough that it became a non-issue for many respondents in this sample. There were no significant differences in comfort with technology scores among the active participation rate groups, which would support the hypothesis that the underlying technology of VCoPs is not a factor. Future research on VCoPs could explore the relationship between general technological aptitude and specific platform ease of use in more detail. It is possible that this particular study did not find general technological aptitude to be a factor due to the fact that simulation-based education has a history of embracing sophisticated technology (Cook et al., 2011).

Comments from the survey and interviews detailed some of the specific platform features that respondents found to be enabling for participation. Some participants valued the ability to connect with the virtual community via email, as this was their primary method of communication while at work. However, community platforms that did not interface well with email were a source of frustration. The common complaint was that linking to conversations directly from email was not seamless, as the user would frequently be prompted for login credentials and then directed to the site’s homepage instead of the desired conversation. This lack of integration would suggest that VCoPs could enhance engagement by removing as many sign-in barriers as possible, including decreasing the number of times that users need to re-authenticate.
5.3.2 Time

Time available while at work was the most polarising of all participation factors. Nearly half of respondents indicated that they had sufficient time while at work, though nearly one-third did not. Time available while at work did not appear to be related to participation frequency, as there were no significant differences among the often, rarely, and never participate groups. This result is inconsistent with previous research (Bock et al., 2006; Y. Chen & Hew, 2015; Lai et al., 2014) where time was a significant influencer. One possible explanation for the differing results is that previous studies looked at time and the intention to participate, whereas the current study examined actual participation. It is also conceivable that this study may not have reliably measured the construct of time, as only a single question was used on the Likert scale (McIver & Carmines, 1981). Future research should examine a more robust measure of time and its influence on actual participation.

While many participants in this study reported that they did not have time to engage in VCoPs, other participation factors may have been salient enough to motivate them to post. Survey comments support this hypothesis, as many referenced being motivated by personal benefits to prioritise time outside of work to participate.

5.3.3 Personal Benefits

Survey respondents strongly agreed that professional networking, problem-solving, and sharing insider knowledge influenced their participation in simulation-based education VCoPs. This result is consistent with Davis’ (1989) Technology Acceptance Model, Social Capital Theory (Nahapiet & Ghoshal, 1998), and several empirical studies.
(Ardichvili et al., 2006, 2003; Chiu et al., 2006; Lai et al., 2014; Scarbrough, 2003; Wasko & Faraj, 2005).

There was less consistent agreement that professional identity influenced active participation in simulation-based education VCoPs, with about 40% of respondents agreeing and nearly 20% disagreeing. There are at least two possible explanations for these conflicting views. First, participants may have not understood the question. As outlined in the literature review, conceptualising learning as a personal growth process in addition to knowledge acquisition is generally not well understood or appreciated (Mann, 2011; Sfard, 1998). Many respondents simply may not have identified with the idea of VCoPs being used to develop a sense of professional identity and were therefore either confused by the question or disagreed with its premise.

A second explanation for why personal identity is inconsistently related to participation in VCoPs is that developing identity may occur at the latter stages of the novice-to-expert continuum of virtual community participation, which is consistent with the communities of practice theoretical framework (Lave & Wenger, 1991; Wenger, 1998). Experts (who actively participated most frequently) are more personally involved in and aligned with the profession (Lave & Wenger, 1991; Wenger, 1998). In this study, the personal benefits score was significantly higher for those who participated often versus those who reported participating rarely or never, which may support the longitudinal conceptualisation of professional growth. The interviews also shed some light on this phenomenon, as most interviewees reported experiencing a turning point where virtual community participation became more than just an opportunity to share knowledge and became a driver for committee work, mentorship and leadership development.
Future directions for research could include a more robust assessment of how developing a sense of professional identity evolves in simulation-based education VCoPs. As noted in the literature review, participants in simulation-based education VCoPs span many roles and clinical specialities, and the development of professional identity may be more complex than in unidimensional VCoPs.

5.3.4 Trust in Community

Survey respondents strongly agreed that trust was a significant factor for participation, a result that is consistent with Social Capital Theory (Chiu et al., 2006; Nahapiet & Ghoshal, 1998) and a comprehensive review of the existing empirical research (Y. Chen & Hew, 2015). Those who reported participating often had significantly higher trust in community score than those who reported never participating. The association between trust and participation rate was to be expected given that community trust is theorised to create social capital, which leads to increased participation (Chiu et al., 2006; Nahapiet & Ghoshal, 1998).

There were differing perspectives of norms of reciprocity in the community. Some survey respondents reported that simulation communities are very willing to share knowledge, while others reported that hoarding of information and competition among programs hindered participation. Interviewees were probed about differences in perceived norms of reciprocity. One interviewee speculated that since some simulation programs are for-profit, individuals from those programs may not feel inclined to share insider secrets with competing programs. While this explanation seems logical, further research with larger sample sizes would be necessary to draw any conclusions.
Another area that requires further study is the role that moderation plays in garnering trust in virtual communities. Qualitative data from this study suggested that moderation could be a key enabler for participation, in that participants value when moderators vet content and commercial posts are filtered out. This finding could be particularly useful in explaining the low observed participation rates in LinkedIn communities, where some participants reported being unsure of whether content had a commercial interest. However, further research into moderated and unmoderated communities would be required to form any conclusions.

5.3.5 Workplace Support

Most respondents (70%) reported that their management team were aware of the benefits of knowledge sharing in simulation-based VCoPs, though fewer (55%) felt that active knowledge sharing was encouraged. There were no significant differences among the often, rarely, and never participate groups on their perceptions of workplace support, which would suggest it may not be a factor influencing participation. This finding is incongruent with reports from several previous studies (Y. Chen & Hew, 2015; DeLong & Fahey, 2000; Hackett, 2000; Janz & Prasarnphanich, 2003). One possible explanation for the discrepancy between this study’s findings and those in the literature is that participants in simulation-based education VCoPs may derive enough motivation from other participation factors to overcome deficiencies in workplace support.

Comments from the surveys and interviews uncovered some of what may lie at the root of differences in perceived workplace support among organisations. Many comments that related to workplace support being a barrier to participation referenced organisations
not perceiving collaboration within virtual communities to be legitimate scholarly activity, unlike in-person knowledge sharing. However, some comments referenced the organisation valuing building positive brand awareness through employee participation in VCoPs. One interviewee stated that organisational perceptions of participation in virtual communities were very positive for knowledge consumption, but less so for sharing, as they were protective of intellectual property. This difference in perceptions of simulation communities as willing to share versus protective of proprietary knowledge appeared in the trust factor as well. Given that knowledge hoarding has been associated with a stagnation in community engagement by some studies (Ardichvili, 2008; Hackett, 2000), further research into how facilitation of knowledge sharing among organisations can occur, while still respecting financial interests, would be of value.

5.3.6 Self-efficacy

Respondents strongly agreed that positive feelings of self-efficacy were a significant factor in simulation-based education VCoPs participation, a finding consistent with previous research (C.-J. Chen & Hung, 2010; I. Y. Chen et al., 2009; Hsu et al., 2007; Lin et al., 2009). Feelings of self-efficacy were significantly higher for those who reported participating often versus those who reported rarely or never participating. The progressive increase in self-efficacy as participants gain expertise is consistent with the communities of practice framework and Social Cognitive Theory (Bandura, 2001; Wenger, 1998).

Comments from the surveys and interviews uncovered some of the qualities that may be unique to simulation-based education VCoPs. The most significant quality relates to the
inter-professional nature of simulation VCoPs, where some respondents noted that their
discussion of technical operations did not necessarily feel comfortable commenting on pedagogy.

An area for further study emerged from one of the interviews. There was a reflection
that high levels of self-efficacy in the community may hinder alternative viewpoints, as
particular authoritative statements accompanied by rich content were observed to shut
conversations down. Though it was a single comment, an examination into how feelings of
self-efficacy in a community might affect the relative level of discourse and sceptical
inquiry might be valuable.

5.3.7 Psychological Safety

Respondents agreed that psychological safety was a significant participation factor in
simulation-based education VCoPs, with a result supported by several previous studies
(Ardichvili, 2008; Ardichvili et al., 2006, 2003; Tseng & Kuo, 2014; Zhang et al., 2010).
Positive feelings of psychological safety were significantly higher for those who often
participated than those who never participated. Survey and interview comments were
limited but did point to feelings of not wanting to be judged or criticised by peers as
barriers to psychological safety, while a sense of sharing a common experience was
reported as an enabler.

Fostering positive perceptions of psychological safety in learners is a core
philosophy of simulation-based healthcare education (Cook et al., 2011; McGaghie,
Issenberg, Petrusa, & Scalese, 2010; Raemer et al., 2011; Ziv et al., 2003). Therefore the
suggestion that negative perceptions of psychological safety were present to some degree in simulation-based education VCoPs is somewhat surprising. It is unclear what the root causes of low psychological safety were among participants in this study. It is possible that the multidisciplinary nature of simulation VCoPs contributed to tension in psychological safety, as there is a historical context of hierarchy and power gradients among the health professions (Price et al., 2014; Thistlethwaite & Jackson, 2014).

One interviewee contributed an observation regarding the potential role that community moderation may have on increasing psychological safety, as participants may feel safer when they can rely on a third party to filter negative comments. How moderation may affect psychological safety is a potential area for future study.

5.4 Content Assessment

5.4.1 Effortful Evaluation

Less than half of respondents reported making an active effort to verify the accuracy of content posted to simulation-based education VCoPs. However, some components of systematic effortful evaluation were present, with nearly 80% of respondents stating that they try to separate fact from opinion, and just over half stating that they try to determine if content is biased in any way. A limitation of this study is that it was not able to establish a reliable aggregate scale to measure practices of effortful evaluation. Regardless, interpretation of the single Likert questions supports the hypothesis that effortful evaluation may not be widely practised by participants in simulation-based education VCoPs. This hypothesis is consistent with prior research that suggests that people rarely engage in a systematic, reliable process of assessing the credibility of content posted online.
(Flanagin & Metzger, 2007; Fogg et al., 2003). Future research could more reliably assess practices of effortful evaluation in simulation-based education VCoPs from an empirical perspective, particularly with the development of a reliable scale, which does not exist in the literature.

Effortful evaluation processes that emerged from the survey comments and interviews focused on assessing the relative scientific merit of content posted, similar to a process of vetting academic journals. It is possible that this practice may be more prevalent in communities that have an academic stream such as simulation-based education, and future research could examine if participants who have experience in scholarship are more likely to employ effortful evaluation.

In this study, differences in effortful evaluation and heuristic use among roles in simulation-based healthcare education (i.e., educator, operations, senior leadership, researcher) were not assessed, as fifty percent of respondents indicated affiliation with multiple roles.

5.4.2 Reputation Heuristic

There was some evidence that respondents used the reputation heuristic to assess the credibility and value of content posted to simulation-based education VCoPs, which is consistent with prior research (Gigerenzer & Todd, 1999; Metzger & Flanagin, 2013; Metzger et al., 2010; O'Keefe, 1990). This finding suggests that there was a tendency to rate credibility by face-value credentials and general reputation in the community. However, it is important to note that reputation had the lowest score of all the heuristic constructs.
In the survey comments and interviews, reputation assessment was most often anchored to visible credentials. While credibility assessment was in most cases positively influenced by credentials, there was one instance where a comment referenced not trusting content posted by someone with a long electronic signature. While this was a single remark, future research could examine the determinants of positive reputation assessment in simulation-based education VCoPs. It is possible that since the simulation community includes both academics and front-line practitioners, perceptions of the relative merit of credentials may differ.

5.4.3 Endorsement Heuristic

The endorsement heuristic was found to be leveraged by participants to assess the credibility and value of content posted to simulation-based education VCoPs, which is consistent with other research (Lucassen & Schraagen, 2012; Metzger & Flanagin, 2013). This result suggests that participants found content to be more credible if multiple people endorsed it. However, this study was limited in measuring endorsement, as only a single question was used on the scale (Mclver & Carmines, 1981). Comments from the surveys and interviews that related to the use of the endorsement heuristic all referenced seeking consensus when problem-solving or seeking advice on specific issues. Future research could determine if endorsement in simulation-based education VCoPs extends past problem-solving to ideological positions as well, a differentiation that has not been studied in online communities to date (Metzger & Flanagin, 2013).

Another area for future research could be to examine if the use of the endorsement heuristic in simulation-based education VCoPs is affected by the relationship between the
person offering an endorsement and the person making the assessment. For example, Metzger and Flanagin (2013) found that if the person endorsing content is well liked by the person doing the assessment, the content is more likely to be trusted.

5.4.4 Self-Confirmation Heuristic

There was evidence that respondents used the self-confirmation heuristic to assess the credibility and value of content posted to simulation-based education VCoPs, which is consistent with the results from other studies (Fischer et al., 2005; Metzger & Flanagin, 2013; Metzger et al., 2010). This finding suggests that participants had a tendency to place more value on content posted that conformed to their intuition, values, and prior experiences. Comments from the surveys and interviews anchored on alignment with prior knowledge, education, and clinical profession (e.g., nursing, medicine). Future research could examine if heuristic assessment favours alignment with values from participants’ primary clinical area of practice to a higher degree than global values espoused by the simulation-based education community.

5.4.5 Expectancy Violation Heuristic

The expectancy violation heuristic was found to be used by participants in this study to assess the credibility and value of content posted to simulation-based education VCoPs, a result that is congruous with previous research (Fogg et al., 2003; Gigerenzer & Todd, 1999; Metzger et al., 2010). This finding suggests that participants tended to rate content more favourably if it conformed to their expectations, including the design and visual attributes of the platform, as well as the spelling and grammar of the content. Respondents were more likely to link poor grammar to an unfavourable credibility assessment than
poor spelling. The researcher is not aware of any theory or evidence that would explain differences in credibility assessment between spelling and grammar, though perhaps spelling errors are perceived to be mechanical while grammatical errors are indicative of flawed reasoning or incompetence. Future research could examine this potential credibility assessment difference in spelling versus grammar in more detail.

Use of the expectancy violation heuristic in the context of simulation-based education VCoPs is potentially troubling from the perspective of participants for whom English is a second language. Each of the communities included in this study communicates in English only, though some specifically identify as being international in scope (e.g., Society for Simulation in Healthcare, International Nursing Association for Clinical Simulation and Learning). It is possible that valuable insights are found not to be credible due to errors in spelling and grammar that may stem from discomfort in writing in English. Further research targeting the perspectives of non-native English speakers would be valuable to ascertain if they feel that their point of view is discredited on the basis of spelling and grammar.

5.4.6 Persuasive Intent Heuristic

The persuasive intent heuristic was found to be used by participants in this study to assess the credibility and value of content posted to simulation-based education VCoPs, which is consistent with other research (Fogg et al., 2003; Lucassen & Schraagen, 2012; Metzger & Flanagan, 2013; Metzger et al., 2010). This finding suggests that participants tended to discredit content that was perceived to have a commercial interest. However,
only a single question was included on the persuasive intent scale, which may limit its reliability (McIver & Carmines, 1981).

Comments from the surveys and interviews uncovered nuances in the use of the persuasive intent heuristic. As expected, content was found to be less credible if it had a perceived commercial interest. However, some comments on the surveys and interviews referenced being sceptical of content based on the platform, regardless of the nature of the content. For example, one comment stated that due to repeated instances of commercial and low-value content being posted, all content posted to LinkedIn groups was viewed with scepticism. Not enough reports of this practice were collected to generalise with any degree of reliability, but this scepticism may partially explain the low participation rates observed in LinkedIn groups. Simulation-based healthcare education VCoPs who host their content on LinkedIn could have an uphill battle establishing and maintaining their credibility.

5.4.7 Interaction Among Heuristics

Metzger and Flanigan (2013) and Gigerenzer and Todd (1999) noted that cognitive heuristics are difficult to study as independent constructs because a single credibility assessment can invoke multiple heuristics. How particular cognitive heuristics interact with each other is a significant gap in the literature (Metzger & Flanagin, 2013), and this study endeavoured to examine how interactions between heuristics manifested in simulation-based education VCoPs.

In this study, cognitive heuristics were associated with each other to varying degrees. The self-confirmation heuristic was positively correlated with every other heuristic, which
would suggest that it may be the most pervasive of all heuristic processes. The reputation heuristic was positively correlated with every other heuristic except for persuasive intent, supporting its relative importance. The endorsement heuristic was significantly correlated with all other heuristics except expectancy violation, suggesting it was also relatively pervasive. No heuristic was leveraged in isolation, and none were negatively correlated with each other. This finding adds empirical evidence to the assertion that heuristics are not mutually exclusive (Gigerenzer & Todd, 1999; Metzger & Flanagin, 2013).

This study also examined how heuristics were used in combination with effortful evaluation. A correlation analysis found that the more likely participants were to actively verify the accuracy of content, the less likely they were to employ the endorsement heuristic. Also, those who reported actively verifying accuracy were no more or less likely to employ any other heuristic (besides endorsement). These correlation results suggest that systematic effortful evaluation was relatively independent of heuristic assessment.

However, other indicators of effortful evaluation did have a positive correlation with heuristic assessment. Attempting to establish fact from opinion was correlated with expectancy violation, and assessing for bias was correlated with expectancy violation, reputation, and persuasive intent. As noted earlier in this discussion, a limitation of this study was the failure to establish a reliable aggregate scale for effortful evaluation, which limits any strong conclusions about how it was associated with heuristic assessment (Gliem & Gliem, 2003). However, these data seem to suggest that certain aspects of effortful evaluation may be associated with heuristic assessment.

The qualitative analysis of the interviews added some clarity to the question of how various heuristic processes interact both with each other and with effortful evaluation.
Each of the five interviewees was asked to describe their process for assessing the value and credibility of content. Each interviewee described a multi-step approach that leveraged more than one heuristic. There was no sequence of heuristics that appeared more than once, though reputation was the first heuristic used most of the time (60%). Effortful evaluation also appeared in 60% of cases, though it was never the first step, which suggests that some participants may have employed heuristics as a first-pass strategy to prioritise what to invest more time and energy in actively verifying.

How decision makers may have weighed competing heuristics was not considered in this study, and is a gap in the literature (Metzger & Flanagin, 2013; Sundar, 2008). The traditional hierarchies that exist among the healthcare professions (Price et al., 2014; Thistlethwaite & Jackson, 2014) may support the supposition that self-confirmation would be the most dominant heuristic in the simulation-based healthcare education VCoPs context, as individual professions may feel particularly aligned, regardless of other heuristics triggered. However, this question is purely speculative and would require careful scholarly examination.

5.5 Limitations and Future Research

Methodological limitations and areas for future research for each participation factor and content assessment process included in this study were discussed in their respective sections. However, there are limitations to the internal and external validity of this study and areas for future research that apply more broadly.
5.5.1 Virtual Community Inclusion

This study leveraged the researcher’s own experience with that of an expert in simulation-based healthcare education to identify virtual communities for inclusion in the content analysis (Appendix A) and it is possible that some VCoPs were overlooked. In particular, virtual communities that do not correspond in English were not examined, along with any regional or otherwise niche communities that the researcher and his colleague were not aware of.

This study also did not include an analysis of informal virtual communities that may have emerged on social media platforms such as Facebook (www.facebook.com), Twitter (www.twitter.com), or Slack (www.slack.com). It is possible that informal virtual communities of practice exist on these platforms outside of a professional association or other central organising body, as was observed by Wesely (2013) in a study of world language educators. Future research could explore the prevalence and characteristics of informal simulation-based healthcare education VCoPs and how they compare with the formal communities included in this study.

5.5.2 Participant Sample

The survey participant pool in this study was well described and suggests some limitations to external validity. First, only seven participants (7%) were from outside of Canada or the United States. It is not known whether the proportion of international respondents was representative of the virtual communities included. It is possible that the participation and content assessment factors researched in this study have a cultural component that was not detectable in this sample. For example, Ardichvilli (2006) noted
that corporate virtual communities of practice in Asia demonstrated particularly high levels of modesty (a component of psychological safety).

Second, though nursing (n=41) and medicine (n=23) were highly represented, the many other health professions that use simulation-based education were not, like paramedicine, psychology, social work, nutrition, respiratory therapy, and physiotherapy. It is unknown if the relative proportion of health professions included in this sample was representative of the virtual communities included in this study. Health professions each have their own unique culture and values (Price et al., 2014; Thistlethwaite & Jackson, 2014) and over-representation of nursing and medicine in this study might limit the degree to which results are representative of the community.

Third, though this study did include a significant number of respondents who always observed and never posted in simulation-based education VCoPs, it did not include any respondents who did not engage with VCoPs at all. It would be valuable to examine the perspectives of simulation-based healthcare education practitioners who do not engage with VCoPs to uncover which of the participation factors are the most salient barriers. For example, while this study found that comfort level with technology was not a significant factor that differentiated levels of active participation versus passive observation, it is possible that a lack of comfort with technology is a significant barrier to signing up for VCoPs in the first place.

Finally, only five survey respondents (5%) agreed to participate in a semi-structured interview, which limits the generalisability of the interview analysis, as it is possible that only highly motivated community members volunteered. Further, a low sample size for the
interviews made it less likely that saturation of themes was achieved (Creswell & Clark, 2011).

5.6 Practical Implications

The following section will highlight key recommendations based on the research in this study for how organisations might most effectively build and maintain vibrant, authentic virtual communities of practice in the spirit of Lave and Wenger’s (1991) framework. Recommendations for how community members can maintain engagement and derive value will be posed as well.

5.6.1 Recommendations for Community Builders

1. Strongly consider hosting virtual communities on a dedicated platform outside of commercial platforms such as LinkedIn, as they may trigger the persuasive intent heuristic and lead to a devaluing and intense scepticism of content.

2. Consider the user experience of the virtual community platform. Study how users prefer to interact with content, be it via the community platform directly or through established tools such as email. Remove as many steps as possible for the login process. While users will interact with a platform regardless of ease-of-use if they derive real benefits from doing so (Davis, 1989), facilitating the process will likely make the community more accessible for novices and less tedious for experts.

3. Consider implementing a “code of conduct” where ground rules such as conflict of interest disclosure, civility, and respect for users of all levels of expertise and points of view are made explicit. This may promote psychological safety and trust in the
community. Consider having community members co-construct the “code of conduct”, as this may increase buy-in and promote joint accountability.

4. Consider the role of community moderation. While this area requires further scholarly inquiry, this study would suggest that active moderation can cultivate perceptions of psychological safety and trust in the community, both of which are directly associated with increased active participation. Moderators could also take an active role in promoting healthy discourse in a topic thread in order to mitigate the potential negative effects of the endorsement and self-confirmation heuristics.

5. Try to anticipate how platform features or policies may trigger or enhance the use of heuristic assessment. For example, many online platforms (e.g., Reddit, Facebook, LinkedIn) allow users to “like” posts. While users may value how this curation makes content assessment more efficient, it is unclear if this may cause an over-reliance on the endorsement heuristic.

6. Consider creating dedicated (but inclusive) spaces within the virtual community for special interest groups to interact in order to promote knowledge sharing efficiency and perceptions of community alignment.

7. Recognise that virtual communities of practice are most valued by users when the social aspects of professional collaboration are directly facilitated and encouraged. While many users (especially novices) may leverage virtual communities for their knowledge sharing function alone, truly vibrant communities of practice are a place where users can network and develop a shared sense of professional identity, as well as mentoring and leadership skills.
8. Advocate for the role that virtual communities play in scholarly discourse, knowledge translation, and innovation. Many organisations and workplaces are aware on the surface of the potential benefits of virtual community participation, though fewer actively facilitate staff participation.

5.6.2 Recommendations for Community Members

1. Give feedback to the hosts of the virtual communities you participate in. Tell them what enables you and motivates you to participate, as well as what acts as a barrier.

2. Cultivate a culture of inclusiveness and psychological safety. Welcome members of varying levels of professional experience and divergent points of view. Consider being a mentor. People who do not actively participate are more likely to have lower feelings of self-efficacy and psychological safety.

3. Consider your own use of heuristics and how it might influence the validity of your credibility and value assessments. For example, many participants in this study associated poor spelling and grammar with a lack of credibility. Does this unfairly colour how we perceive the value of content posted from those who speak English as a second language, or who are unfamiliar with the norms and trappings of scholarly writing?

5.7 Conclusion

This study was the first formative analysis of simulation-based healthcare education virtual communities of practice, and presented three main findings.

First, simulation-based healthcare education VCoPs varied in composition but generally fit one of two prevailing models: hosted forums or LinkedIn groups. Hosted
forums had more robust participation levels than LinkedIn groups, and a qualitative analysis of user opinions suggested that content hosted on LinkedIn was met with more scepticism and was seen as less valuable than forums, partially due to the commercial nature of LinkedIn. Implications for simulation-based education VCoPs providers include choosing a platform carefully, as robust participation might be difficult to establish and maintain on LinkedIn.

Second, engagement in simulation-based healthcare education VCoPs spanned from passively observing to actively participating, as was expected in the professional communities or practice paradigm (Wenger, 1998; Wenger et al., 2002). There were seven factors that VCoPs participants in this study identified as significantly affecting their motivation to participate, including platform ease of use, time, trust in community, direct and indirect personal benefits, workplace support, self-efficacy, and psychological safety. However, neither time or workplace support were associated with any differences in participation, which suggests that they were the least important of the factors. Implications for simulation-based education VCoPs providers include optimising platform ease of use, encouraging utilitarian knowledge-sharing along with opportunities for professional growth, and fostering conditions that lead to positive feelings of self-efficacy and psychological safety.

Finally, simulation-based healthcare education VCoPs participants in this study rarely engaged in a systematic process of content credibility and value assessment, and instead relied on various cognitive heuristics to efficiently evaluate content. Five heuristics previously studied in general online media including reputation, endorsement, self-confirmation, expectancy violation, and persuasive intent (Metzger et al., 2010) were found
to be leveraged in the simulation-based healthcare education VCoPs included in this study. Individual heuristics rarely occurred in isolation, and formed various sequential processes of assessment that varied in composition. The implications for heuristic assessment are most important for simulation-based healthcare education VCoPs participants. Although there is some evidence that heuristic assessment is more efficient and equally as accurate as systematic, effortful evaluation (Gigerenzer & Todd, 1999), consequences of heuristic assessment are far from well understood. It is possible that individual biases are unfairly shaping how content is evaluated in simulation-based healthcare education VCoPs.
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## Appendix A – Virtual Communities Included in Study

<table>
<thead>
<tr>
<th>Community Name</th>
<th>Platform</th>
<th>Description</th>
<th>Registered users (as of August 31, 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laerdal Simulation User Network</td>
<td>Open Forum</td>
<td>Manufacturer-hosted forum discussing use and troubleshooting of simulation technology</td>
<td>123,340*</td>
</tr>
<tr>
<td>Society for Simulation in Healthcare SimConnect</td>
<td>Paid Members Only Forum</td>
<td>International, interprofessional simulation society (paid) member forum – discussions on program design, administration, technical operations</td>
<td>3,600</td>
</tr>
<tr>
<td>Center for Medical Simulation Networking Group</td>
<td>LinkedIn Group</td>
<td>Networking and discussion geared towards friends of Harvard's simulation program (harvardmedsim.org)</td>
<td>2,865</td>
</tr>
<tr>
<td>HealthySimulation - Medical Simulation News and Resources</td>
<td>LinkedIn Group</td>
<td>Simulation news, product reviews, resource links</td>
<td>2,759</td>
</tr>
<tr>
<td>INACSL - International Nursing Association for Clinical Simulation and Learning</td>
<td>LinkedIn Group</td>
<td>Simulation news and discussion geared towards nurses</td>
<td>1,907</td>
</tr>
<tr>
<td>Society for Simulation in Healthcare</td>
<td>LinkedIn Group</td>
<td>Discussions on simulation literature, news, operations</td>
<td>1,467</td>
</tr>
<tr>
<td>Gathering of Healthcare Simulation Technology Specialists - SimGHOSTS</td>
<td>LinkedIn Group</td>
<td>Technical and operational discussions</td>
<td>562</td>
</tr>
<tr>
<td>Society in Europe for Simulation Applied to Medicine - SESAM</td>
<td>LinkedIn Group</td>
<td>Discussion group for European interprofessional simulation society</td>
<td>404</td>
</tr>
<tr>
<td>SIM-one - Ontario Simulation Network</td>
<td>LinkedIn Group</td>
<td>Networking and discussion group geared towards Canadian simulation programs</td>
<td>171</td>
</tr>
<tr>
<td>SP-Trainer</td>
<td>Listserv</td>
<td>Discussions geared towards standardized patient (SP) educators</td>
<td>135</td>
</tr>
<tr>
<td>National League for Nursing Simulation Innovation Resource Center</td>
<td>Open Forum</td>
<td>Nursing-focused discussions on simulation best practices, research, faculty development, and technical issues</td>
<td>Unknown (not published)</td>
</tr>
</tbody>
</table>

*Note. *Nature of open forum permits users and organizations to have multiple accounts
Appendix B – Online Survey

Demographics

1. Are you male or female?
2. In what country do you currently reside?
3. What is your age?
4. How many years have you been practicing in the field of simulation-based healthcare education?
5. What is your role within simulation-based education? (check all that apply): (Faculty, Facility Manager, Technician, Program Director, Curriculum Developer, Researcher, Simulated/Standardized Patient, Sales Representative, Administrative Support Staff, Other (please specify))
6. What is your primary professional area of practice?

Virtual Community Participation

7. How long have you been participating as an observer in online simulation communities (i.e., reading posts)?
8. How long have you been participating as an active contributor in online simulation communities (i.e., posting new content, responding to others’ posts)?
9. In online simulation communities, how often do you:
   a. Read postings (Multiple times per day, Once per day, 2-3 times per week, Once per week, Once per month, Less than once per month, N/A)
   b. Post content (Multiple times per day, Once per day, 2-3 times per week, Once per week, Once per month, Less than once per month, N/A)

Participation Factors

Likert Questions

Please indicate your level of agreement with the following statements (5-point Likert Scale: Strongly disagree, Disagree, Neither agree or disagree, Agree, Strongly agree):

10. The ease of use of an online simulation community’s interface is a significant factor in determining how much I participate.
11. I feel that my comfort level with technology affects how much I engage with online simulation communities.
12. I have sufficient time while at work to participate in online simulation communities.
13. Sharing knowledge in an online simulation community will lead to direct benefits for me (e.g., boosting self-esteem, increased job performance, etc.).
14. Participating in online simulation communities affords me the opportunity to share “insider” knowledge.
15. I turn to online simulation communities to answer complex questions about my practice that I could not easily solve alone.
16. Participating in online simulation communities expands my professional network.
17. Participating in online simulation communities influences how I perceive my professional identity.
18. Trusting the good intentions of online simulation community moderators affects the degree to which I participate.
19. Contributing knowledge to an online simulation community makes it more likely that my own questions will be addressed.
20. I feel that my professional values align with those of the online simulation communities in which I share knowledge.
21. Participating in online simulation communities is an efficient way to share knowledge.
22. My workplace management are aware of the benefits of knowledge sharing practices in online simulation communities.
23. My workplace management actively promotes knowledge sharing in online simulation communities.
24. I am confident in my ability to contribute valuable content to online simulation communities.
25. The uniqueness of my personal experience in simulation-based education adds value to what I am able to contribute to online simulation communities.

26. By asking questions in online simulation communities, I am concerned that my level of competence will be judged by others.

27. I am concerned that offering my point of view or experience in response to online simulation communities’ user requests will be perceived as immodest.

Open-ended Survey Questions

28. Please outline any other factors that you feel enable you to participate in online simulation communities:

29. Please outline any other factors that you feel act as a barrier to your participation in online simulation communities:

30. Please outline any other factors that you feel affect your motivation to participate in online simulation communities:

Content Value and Credibility Assessment Factors

Likert Questions

Please indicate your level of agreement with the following statements (5-point Likert Scale: Strongly disagree, Disagree, Neither agree or disagree, Agree, Strongly agree):

31. I make an active effort to verify the accuracy of the content.
32. I attempt to establish whether the post constitutes fact vs. opinion.
33. I consider the motivations of the person who made the post.
34. The credentials of who made the post are an important factor in my assessment of the value of the information.
35. The poster’s reputation in the community is an important factor in my assessment of the value of the information.
36. If I read a post in an online simulation community that is endorsed by others in the community, it makes it more likely that I will find the post to be credible.
37. I tend to trust the credibility of a post in an online simulation community if it falls in line with my own experience.
38. I tend to trust the credibility of a post in an online simulation community if it makes intuitive sense to me.
39. If I see a post in an online simulation community that contains incorrect spelling, it makes me less likely to trust the content.
40. If I see a post in an online simulation community that contains poor grammar, it makes me less likely to trust the content.
41. I am more likely to trust content posted in an online simulation community if the design and interface are professional.
42. Commercial postings (where the author has some apparent financial interest), are less credible to me than non-commercial postings.

Open-Ended Survey Questions

43. What would you say contributes most to how likely it will be that you will incorporate knowledge gained from an online community into your own practice environment?
44. Are there any other factors that you can think of that affect how you value content posted to online simulation communities?
Appendix C – Semi-structured Interview Questions

1. Which online simulation communities do you engage in, either as an observer or an active participant?
   a. What are some of the key features that you notice in common between the various communities that you participate in?
   b. What differences do you perceive between the online simulation communities that you engage with?
   c. Thinking of the online community or communities you like best, what makes you like it/them?
   d. Thinking of the online community or communities you don’t like, what makes you dislike it/them?

2. Did you immediately begin actively contributing to online simulation communities, or did you begin as an observer?
   a. What made you feel comfortable to start actively contributing vs. observing?
   b. Are there differences in your contribution vs. observation levels between the various online communities? If so, why do you think that is?

3. What motivates you to participate in online simulation communities?
   a. When asked about motivating factors for participation on the online survey, some respondents noted that the simulation community in general is very open and forthcoming, while others see a lot of protection of proprietary knowledge and processes in order to maintain a competitive advantage for their organization. What’s your perspective on this?

4. Do you feel in any way that participating in online simulation communities has impacted how you perceive your own professional identity or growth in your role as a simulation professional?
   a. How so?

5. Many of the survey respondents cited lack of time as a barrier to online simulation community participation. Does that resonate with you?
   a. Would you say that your organization values the time that you are able to contribute to online simulation communities?

6. Some survey respondents indicated that there tends to be a disproportionate number of novice or basic questions posted to the communities, and that they frequently are repetitive in nature. Is this something that you have noticed as well, and if so, does it affect your motivation to participate?

   I’d like to spend a little time talking about how you assess the value of content that is posted to online simulation communities. By value, I mean how trustworthy or credible you find the content, as well as how likely you will be to incorporate the knowledge into your own practice.

7. Can you walk me though how you evaluate the trustworthiness of content that is posted in an online simulation community?
   a. Are there differences in your evaluation process between the various communities you participate in?
   b. What factors contribute to how likely it will be that you will incorporate knowledge gained from an online community into your own practice environment?
Appendix D – Online Survey Recruitment Letter

Dear colleagues,

I am inviting you to participate in my Master’s research study titled *Virtual communities of practice in simulation-based healthcare education: Motivating factors, enablers, and content value assessment.* Dr. Robin Kay of the Faculty of Education at the University of Ontario, Institute of Technology is my faculty supervisor for this thesis research.

The purpose of this study is to clarify what enables and motivates simulation-based healthcare education professionals such as yourselves to participate in virtual communities of practice, as well as how you assess the value of content posted therein. In order to accomplish this, I would like to explore your perceptions through an anonymous online questionnaire.

Completion of this survey will take approximately 15 minutes of your time. **At the conclusion of the survey, you will have the opportunity to enter into a draw for a USD $100 Visa gift card.**

If you have any questions about the study please contact me (jordan.holmes@uoit.ca), or my supervisor Dr. Robin Kay (robin.kay@uoit.ca).

This project has been approved by the UOIT Research Ethics Board as of September 3, 2015, REB # 15-006.

If you are willing to complete the online questionnaire, please click here: [https://www.surveymonkey.com/s/SimVCoPs](https://www.surveymonkey.com/s/SimVCoPs)

Many thanks,

Jordan Holmes
M.A. candidate, Faculty of Education
University of Ontario, Institute of Technology
jordan.holmes@uoit.ca
Appendix E – Interview Letter and Consent

Study Title: Virtual communities of practice in simulation-based healthcare education: Motivating factors, enablers, and content value assessment

Researcher: Jordan Holmes  
M.A. candidate, Faculty of Education  
University of Ontario, Institute of Technology (UOIT)  
jordan.holmes@uoit.ca

Faculty Supervisor: Dr. Robin Kay  
Director of Graduate Studies  
Professor - Faculty of Education  
University of Ontario, Institute of Technology (UOIT)  
robin.kay@uoit.ca

Purpose of the Study
The purpose of this study is to clarify what enables and motivates simulation-based healthcare education professionals such as yourself to participate in virtual communities of practice, as well as how you assess the value of content posted therein. In order to accomplish this, I would like to explore your perceptions through a telephone or online interview.

Study Procedures
The one-on-one semi-structured interviews will follow the same process, and the interview guide will be carefully followed. The goal of the interviews is to provide further insight and nuance into themes collected from the online questionnaire, which you may have completed already. The interview is expected to take approximately 30 minutes of your time. At the end of the interview, you will be invited to provide any additional information that you would like to share that was not covered in the interview.

Conditions for Participating
The interview will be audio-recorded, with your consent, and transcribed. The transcript will be shared with you for review and requested changes (if any) within 30 days following your interview. Your participation in the study is completely voluntary and you are free to decline to answer any question(s) you do not want to answer or withdraw from the study at any time without explanation or penalty of any kind, before I receive your reviewed and approved interview transcript back from you. If you do decide to withdraw, all data collected up to that point will be destroyed and not included in the study findings. After you have approved and returned your interview transcript, all data received from you will be included in the findings.

Risks/Benefits
There are no reasonably foreseeable risks, harms or inconveniences associated with participation in this study. Though unlikely, you may encounter a minimal psychological risk, as you will be asked to engage in reflection on your professional practice and attitudes towards how you value information. You are free to decline to answer any questions that make you uncomfortable without any explanation or penalty of any kind. You may also encounter minimal social risk, as your identity will be known to me, and we are both members of the same virtual communities. However, your identity will never be disclosed and your responses will be kept absolutely confidential.

While there are no direct benefits for study participants, the findings will provide valuable insights for simulation-based healthcare education virtual communities of practice, including community moderators and participants. The findings may raise interesting and provocative insights that will hopefully generate further discussion of this topic.

Access to Information

Throughout the data collection and analysis process, all data related to the online questionnaires, interviews, and all summary reports will be stored in a locked cabinet in my home to which only my thesis supervisor and I will have access. Audio recordings will be erased as soon as I receive the validated interview transcript back from you. All digital data will be stored on an encrypted USB key.

The digital interview files will be deleted after the transcripts have been validated by the interviewees. Within one year of the successful completion of all of the requirements of my master’s program, I will destroy all confidential data; paper records will be shredded and electronic records will be permanently deleted. De-identified data will be kept for five years following the successful completion of all of the requirements of my master’s program in case any secondary analysis is necessary, and will then be destroyed.

Confidentiality

Participants and their institutions will not be identified in any reporting of the findings in my thesis or in other relevant professional meetings, conferences or publications. Only non-identifiable pseudonyms will be used in any reporting of the findings, and all data will be kept confidential and secure, accessible to only me and my thesis supervisor.

Publication of Results

The results of this study may be published or used in public presentations. A report summarizing the results will be available in spring 2016. If you would like to receive the summary report, please send me an email (jordan.holmes@uoit.ca) to request a copy.

This study has been approved by the UOIT Research Ethics Board as of September 3, 2015, REB # 15-006. If you have any questions regarding your rights as a research participant, please contact The Office of Research Ethics, Compliance and Safety, UOIT (compliance@uoit.ca).