Featured Article

Virtual Gaming Simulation: Exploring Self-Debriefing, Virtual Debriefing, and In-person Debriefing

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Abstract

Background: Best practice guidelines exist for debriefing, but only a little is known on how these align with the unique attributes of virtual simulation. This study explores self-debriefing, virtual debriefing, and in-person debriefing methods after a virtual gaming simulation.

Methods: A focus-group-study methodology was employed with a convenience sample of 24 nursing students. The study was theoretically informed by the 3D Model of Debriefing.

Results: Study results were categorized according to four thematic areas including defusing, discovering, deepening, and environment.

Conclusion: This study provides insight into design and implementation of various debriefing formats using the unique features of virtual simulation.

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Debriefing is central to the simulation learning experience in nursing and health professions education (Decker et al., 2013; Verkuyl, Lapum, St-Amant, Betts, & Hughes, 2017b). Debriefing enhances learning by providing opportunity for reflecting one’s experiences and decision-making, identifying gaps in knowledge, and transferring knowledge to practice (Al Sabei & Lasater, 2016; Decker et al., 2013). However, much of the debriefing research is carried out in the context of in-person simulation. The unique attributes of virtual simulation require careful consideration in the debriefing process (Verkuyl et al., 2017b). One of the attributes is individual reflection, the ability to repeat the experience and analytics that can be included in the debrief phase. At this time, there is no clear understanding of how these attributes influence the debriefing process.

We conducted a focus-group study to explore the impact of three debriefing formats (in-person, virtual, and self) after a virtual gaming simulation (VGS). In this article, we present the study’s focus-group findings that provide insight into how student reflection unfolds within these debriefing methods.

**Key Points**
- The expansive uptake of virtual simulation in health care education calls for innovative debrief formats and designs.
- Learning and reflection occurred in self-debrief, virtual debrief, and in-person debrief after a virtual gaming simulation.
- Deep and authentic reflection occurred with self-debriefing, providing opportunity to analyze one’s own decision-making without being influenced by others.

**Background**

Well-established standards for debriefing include competent facilitators familiar with the simulation, safe and supportive learning environments, theoretically informed debriefs, and congruence with simulation learning outcomes (INACSL Standards Committee, 2016). These standards are supported by recent literature reviews (Hall & Tori, 2017; Levett-Jones & Lapkin, 2014), but only a little is known about how these best practices are aligned with the unique attributes of virtual simulations.

There has been exponential increase in the creation and study of virtual simulation platforms across health care disciplines (Cobbett & Snelgrove-Clarke, 2016; Darragh et al., 2016; Foronda, Gattamorta, Snowden, & Bauman, 2014; Lapum et al., 2018; Verkuyl, Atack, Mastrilli, & Romaniuk, 2016). However, the inclusion of debriefing is only noted in a few studies (Foronda et al., 2014; Mathew, Brewer, Crist, & Poedel, 2017). When debriefing is noted, it is an assumed activity, and few details are provided. In a previous study evaluating the effectiveness of VGS, we found participants using focus groups to debrief their simulation experience (Verkuyl et al., 2017a). Gordon (2017) provided a commentary of his design and implementation of web-based conferencing to debrief asynchronous virtual simulations. Gordon recommended a maximum of 10 students per group, facilitation by faculty members, and offering multiple time slots for timely debrief. Alternatively, in the in-person simulation context, two studies highlighted that self-debriefing provided similar educational outcomes compared with facilitator-led debriefing (Boet et al., 2011; Oikawa et al., 2016).

It is unclear what types of debriefing methods are most effective for virtual simulation. In the virtual environment, facilitators may not be participating in the simulation, and there is less control over the timing of debriefs. This study presents considerations in debrief design which address the unique features of VGS learning, such as asynchronous content delivery and increased accessibility for learning.

**Study Intervention**

First-year baccalaureate nursing students played a VGS (see https://de.ryerson.ca/games/nursing/mental-health/game.html#), assuming the nursing role in a home visit focusing on the assessment of mental health and interpersonal violence. Film clips provided realistic images of the clinical setting in which the student was prompted to make decisions from the health care provider’s perspective. During the simulation, students were offered different choices on how to proceed while collecting assessment data, making intervention decisions, and experiencing the consequences of their choices. Students were provided with immediate feedback and rationales related to their decisions. After completing the 13 decision points, students received an autogenerate, individualized summary report of their decisions with feedback. Within 72 hours, students attended a randomly assigned debrief: self-debrief (SD), facilitator-led in-person debrief (IP), or facilitator-led virtual debrief (VD). The SD was a document with the same debriefing questions as the other groups. The student was required to write or type their responses. Faculty members with simulation experience, who attended the study’s debriefing training, led the facilitator-led debriefs. The same question guide based on the 3D Model of Debriefing was used in all debriefs (Table).

Students were oriented to the VGS and debrief process and were instructed to bring their summary report to the debrief session. Although the VGS and debrief were course-mandated activities, study participation was voluntary.
The impact of the Defusing phase was varied across the debriefing experiences. Three focus groups were conducted, one for each debrief type, using convenience sampling techniques. As per recommendations (Burns & Grove, 2005), we aimed for six to 10 participants per group. A semistructured interview guide was used (Morgan, 2010) with open-ended questions as follows: (a) Tell me about your experience in terms of debriefing the simulation? and (b) in what ways did the debriefing facilitate your reflection? Focus groups were audio-recorded and lasted 60 minutes. We used a descriptive and exploratory approach for qualitative thematic analysis (Braun & Clark, 2006) informed by Zigmont et al.’s (2011) 3D Model of Debriefing. Using a team approach to analysis, we reviewed the transcripts individually and then as a group. After analysis of all focus groups, we reflected on the identified codes across all groups and categorized codes into themes. The participating institution’s research ethics board approved the study. Students provided informed consent before participating.

### Study Results

Twenty-four students participated in the focus groups. They were mainly female (83%), 17 to 20 years of age (82%), and 96% were taking the course for the first time. Study results were categorized into four main thematic areas. Although the codes and themes were not identified a priori, the 3D Model of Debriefing informed our analytic discussion. As we progressed in the data analysis, we found that the codes that emerged could be thematically captured under the four parts of the 3D Model of Debriefing, such as defusing, discovering, deepening, and environment. In the results, we abbreviated the assigned debriefing types as IP, SD, and VD.

#### Defusing

Defusing is the first phase of the 3D Model. It involves discussions of how the simulation impacted learners emotionally and recaps how events unfolded (Zigmont et al., 2011).

The defusing phase facilitated sharing of emotions and questions that participants may not have realized were important. The debrief was described as “the time where we talk about our choices” (IP). One IP participant commented, “[the debrief] really helped open us to things that are hiding in the back of our heads that we did not really think was that important”, whereas another participant stated, “I did not realize I had all those questions until I was actually in the debrief.” One SD participant remarked having not focused on his/her feelings during the simulation. However, a debrief question asking about how they felt prompted the sharing of emotions: “I realized I was still shaking … [the simulation] was really nerve wracking … I was really able to think about it, when in reality if I did not have that prompting question, I probably would not have thought about it at all.”

The impact of the Defusing phase was varied across the debrief methods. A participant in the SD group highlighted

### Theoretical Framework

The 3D Model of Debriefing (Zigmont, Kappus, & Sudikoff, 2011), based on Kolb’s (1984) principles in experiential learning, adult learning principles, and the Learning Outcome Model served as the study’s theoretical framework. Zigmont et al.’s (2011) conceptual definitions of defusing, discovery, and deepening informed the debrief question guide. The model supports a psychologically safe environment to move the learner from expressing their feelings regarding the experience to reflecting on the experience and making connections from the experience that can be applied to future clinical practice environments (Zigmont et al., 2011).

### Methods

A focus group methodology was employed (Liamputtong, 2011) to provide students opportunities to share their debriefing experiences. Three focus groups were conducted, one for each debrief type, using convenience sampling techniques. As per recommendations (Burns & Grove, 2005), we aimed for six to 10 participants per group. A semistructured interview guide was used (Morgan, 2010)
that defusing during the debrief “help(ed) prevent bottling up negative feelings.” Another participant referred to having “more confidence after reflecting” during the debrief and explained “it’s a way of determining what I know and do not know. It made me a little bit confident… I can fix the things I do not know.” Participants referred to how peers influenced defusing as “Now, I’m not scared to say my opinion… when there’s so many other people in the same boat as you with the same experience, and you are kind of more comfortable” (IP). However, a VD participant stated that nonverbal body language was less visual, affecting their capacity to know how others felt, “if I can’t see that [in person], sometimes you do not build up that courage to continue to press on [to discuss the issue]. I kind of just shriveled away.” Occasionally, there were unresolved emotions, more often reported in the VD group. One participant commented, “I did not feel satisfied about the discussion”, in terms of feeling uncomfortable about directly asking the client about suicide plans. Despite some unresolved feelings, one participant in the VD also stated that “talking with everybody… having the facilitator help us… it clicked in my head, you have to balance out what you do to establish trust with the client and what you do to keep yourself safe… it was not unsettling to me anymore.” The unresolved feelings may be related to personal issues surrounding the topic of suicide rather than the debrief format.

Discovering

Discovering, the second phase of the 3D Model, involves learners’ observation and analysis of their performance, with identification of mental models and rationales for their behaviors during simulation (Zigmont et al., 2011). In our study, three subthemes influenced discovering: peer perspectives, learning from peers, and reflection.

Peers’ perspectives facilitated learning in the discovering phase. Participants described hearing other “perspectives” (IP) and “different opinions” (VD). For example, “someone would say an idea and then another person would add on to that and you would end up having a conversation… really helped us connect with other people… open our mind to different things and engage everyone” (IP). They reported that exposure to peers’ perspectives influenced their thinking and provided ideas on “what is a better answer” in the simulation (IP). One participant commented, “I would hear someone else talk about what they felt, and their opinion on the answer and I would be ‘that’s actually a good idea’… [I did not] completely change what I feel but add on to what I feel” (IP). One participant in the SD group remarked, “I loved reflecting on myself and really looking into what I did [during the VGS], but I wanted to hear what other people had trouble with, just to see if it’s not just me who’s struggling.”

Part of the discovering phase demonstrated how participants learned from peers while analyzing their decisions from the simulation. Participants remarked that the debrief provided opportunity to “listen to everyone” (IP) and “hear everybody’s ideas [which] really helped me learn about what I did wrong or what I did right” (VD). Other IP participant referred to how the group “talking” helped them “make sense” of and recognize “valid reasons” for the best course of action in the simulation. VD participants explained that listening to others helped them “compare” their own reasoning with “their [peers’] reasoning… it really helped me to understand ‘oh, this is why,’… so you were able to think about [the decisions] you made during the game more.” Another participant indicated that their peers helped them “learn how to structure a question” (VD) in the simulation. Discussions about peers’ decision-making during the simulation prompted participants to make connections: “It [the discussion] got us thinking and helped make a connection to class” (VD).

All debrief methods demonstrated reflection. The debriefing was described as an opportunity to “reflect on things I did not think of” (SD) when playing the game and “reflect on my responses” (IP). One participant commented on getting “almost everything wrong” during the simulation and explained that during the SD, “it allowed me to reflect better because I found myself thinking about the errors I made and connecting it to the notes I made from class… then I realized where I went wrong.” Many times the dialog that occurred during the group debriefs influenced participants’ reflections. One participant commented, “it helped me explore other options… if it was not for the debrief, then I would have been my stubborn self and been like ‘no, I was right.’” (IP). Referring to the VD, one participant noted, “[it] allowed me to validate my own opinion… makes me think ‘oh, I have to study this’… because listening to other people talking… helped me organize my set of thoughts.”

It was clear that the debrief questions provided opportunities for reflection, enhanced participants’ knowledge, and impacted their self-confidence. One IP participant stated:

A wake-up call to be more cautious of what I say and how I’m saying it… not only to be conscious of the patient, but the environment… I did not look at the lighting, I did not see the boots in the corner, and I did not realize that she had pulled down her sleeves… those little things make such a big difference.

Another participant commented, “that you have to really think, it’s not just… step one, step two, it’s different in every situation” (IP). A participant in the SD group remarked how “writing helped solidify my learning… made me more confident because it made me address the why’s of a situation” in terms of best actions. Another participant noted the SD led to “questioning the timing
and order of actions such as establishing the therapeutic relationship, mental health assessment, and suicidal risk assessment.” An IP participant explained that “debrief showed me that … I have to worry about myself [my safety] … I’m more confident now but during it [the simulation], I did not even think about myself” when choosing the correct answer in the simulation. In moving forth, one participant stated, “we honed in on this new knowledge … expanded on what we did not know with the SD so, if we did not understand something I think that triggered us to … think about why we did not know what we did not know.”

The SD group described deep and authentic reflection on learners’ own thinking and decision-making that was not as evident in the group debriefs. One participant commented, “when you’re by yourself, you are focused entirely on what you did … really able to analyze what happened for me” in the simulation. Another participant remarked that “rather than just listening to other people like in a group … we were able to focus on our own thought processes … my weaknesses and my strengths and where I went wrong.” In addition to focusing on one’s own decision-making, participants noted that the SD provided opportunity to be more authentic in their reflections, “[I] answer more honestly” as opposed to in a group where you give “the politically correct answer” and may be “hesitant” to “say what you truly think.”

**Deepening**

Deepening, the third phase of the 3D Model, highlights the cognitive learning that occurs as students begin to connect new mental models of learning to their future clinical practice (Zigmont et al., 2011). Three subthemes illustrated how participants engaged in the deepening process during the debriefing: knowledge integration, connections to practice, and connections to professional nursing role.

Knowledge integration is where students build on their existing knowledge to increase their understanding of client situations. One participant commented, “the in-person debrief really helped us connect what we’ve learned before and add it to that.” Another IP participant stated, “it really hit me that it’s more than just, being there for your patient, it’s like you got to be aware [of danger].” The Deepening phase supported integration of past and current knowledge, “I felt like the debrief collected everybody’s opinions, my opinions and our thoughts [about decision making in the VGS] and put it all together and it just made more sense” (VD). Another participant stated, “the written debrief … helped us to integrate and kind of own the knowledge versus just having read it once or twice or three times and then not knowing whether you actually knew it” (SD).

Making connections to practice was identified as another theme in the deepening phase. One participant commented, “[we] talked about every single option … it kind of stretches our thinking for when we are really in the situation … what we would say in real life or in clinical” (IP). Another participant remarked, “[we] took a lot away from it that will help us in reality when we’re dealing with the situations.” A participant shared that the SD “made me summarize in a big picture and helped me be able to take that knowledge and apply it to real world situations.” Another referred to the SD as “helpful … it gave me a good way to remember if I were in the situation again, I’d know what to do … I have a better understanding of why I should be doing this and not this.” The participants’ comments reflected their learning and how they anticipated using their new knowledge in future clinical practice.

Focus group participants also described a deepening in their understanding of their professional nursing role. The IP discussion assisted students to identify the need to “be careful crossing the personal and professional therapeutic relationship … focusing more on what the patient wants and needs rather than my own curiosity.” Another participant commented, “the discussions helped us walk away with setting those boundaries between being professional and therapeutic also developing those genuine connections.” These comments reflected how the debriefing process helped students to gain a deeper understanding of their new professional role.

**Environment**

Environment is described by Zigmont et al. (2011) as the social space that facilitators create and the physical space where debriefing takes place. Two subthemes emerged as part of the environment theme: facilitation (including guidance and clarification) and structure (including group attributes, simulation process/summary report, and physical attributes).

Facilitation involved an expression of how participants felt guided by the brief questions and facilitators. One participant stated that “I think that the facilitator asking questions really guided the in-person debrief and had us touch on everything.” In the VD, the facilitator had the capability to ask a question and also type it into a chat box. One participant commented, “I was able to sit and ruminate and read the question over again and really think back.” The debrief questions focused students’ reflection and broadened discussions of their simulation experience. In the group debrief formats, facilitator guidance promoted open and nonjudgmental discussions that validated learners’ responses to the simulation. One participant remarked, “The way she answered our questions, even if we had a wrong response, she did not make us feel stupid … that also encouraged people to talk more” (IP). Participants discussed the effectiveness of facilitators in threading the dialogue commenting, “[this approach] facilitated me to think more about my answers and my questions so, I had my opinions and then adding on to it
with everyone else’s opinions … aided my thought process” (VD). SD participants highlighted how the question guide “forced me to think my way through [it]” and “it was written there for you to do it, go through all the questions.”

Clarification was an important component of the facilitation subtheme in which facilitators explained questions and ideas, “[the facilitator] opened my mind and helped me understand” (IP). This idea was echoed by a participant in the VD, “[the facilitator] would clarify or verify something and ask us a couple or follow up questions … it really helped and also provided people with some context.” In the SD group, participants lacked a sounding board to dialogically make sense of their simulation decisions. One participant commented, “I wish somebody could have guided me why this was wrong, why my answer was wrong.” SD participants sought clarification through informal dialogue with peers, whereas some chose to participate in the focus group to seek additional clarification.

Group attributes were important components in building a supportive debriefing environment. All participants commented on the group dynamics or lack thereof. Allocating a maximum of ten participants per group was viewed positively as a way to encourage dialogue. One participant remarked, “If it was a little bigger, more people would not talk because they would expect others to talk … if there’s too little, you would not get enough information or point of views” (IP). Group membership facilitated open discussion, as one participant said, “I like the fact that it was people from our own labs. Cause it just seemed a lot more comfortable sharing your opinions” (IP). Participants in the VD had mixed views regarding group dynamics. One participant noted it was “awkward for me, because my group … was really quiet,” whereas another shared, “at the group session I could hear from other people that I usually do not talk to.” Despite being a solitary activity, the SD participants appreciated opportunities to reflect individually, “Sitting there by yourself and having time to think, reflect and really understand … you do not feel pressure to produce an answer right away.”

The summary report was identified as important to the debriefing, “I had my online notes in front of me and the summary report printed out. That really helped guide my learning” (SD). Participants in the IP said, “I forgot about the choices I made and the summary report made me think about why did I even answer this in the first place or why do I think this answer is now wrong or now right.” A participant in the IP group noted that the summary report helped participants realize that other learners went through similar experiences, commenting “we saw that … [what] everyone did and it’s not just me going through this and not everyone got perfect.”

Physical attributes, such as location, setting, privacy, length, and timing of debrief affected participants’ debriefing experience, both positively and negatively. Participants who are self-debriefed or virtually debriefed felt the comfort of home offered the capacity to focus: “it promotes more free speech and communication” (VD) and “to do it alone at home in my room allowed me to pull up on my laptop the questions, my notes and the [summary] results” (SD). Participants appreciated the need for confidential spaces. IP participants commented positively on the “private” setting in a circular formation, “It felt like our opinions and our ideas are in this room and only stay in this room,” whereas another commented, “the set-up of the table … facing each other … I was focused.” There were mixed views in the VD group, “I did not really sense like the judging gaze of individuals, like you could just see people’s pictures … I did not feel insecure to speak,” whereas another person commented that not being able to see nonverbal language “made me reluctant to talk.” VD participants reported distractions with setting up in public locations, whereas others recalled the effect of a calming space “the sun was rising in the window and I was on my laptop, that was nice.” Although VD participants noted the ease of using technology, others recommended “a tutorial beforehand.” Debrief lengths varied from 50 minutes in the group debriefs to 10 to 30 minutes in the SD. All participants agreed the time was sufficient. Despite the shorter length of time, it appears that participants reflected before completing the SD as one stated, “I had time to mull it over and really think about it, so that’s why I was able to answer the questions more quickly.”

Discussion

Our work highlights design features that facilitated the unfolding of reflection and learning in all three debriefing formats. We used a theoretical framework to ground the debriefing questions as recommended by the INACSL Standards Committee (2016). The same debriefing guide was used across all groups. A distinctive feature is the individual summary report, generated from the VGS, which reminded students of the reasoning behind their decision-making and led to richer debriefing discussions. Reflection and learning were influenced by facilitators and peers in the group debriefs. What was unique to our study was the deep and authentic reflection that occurred in the SD group, as it provided opportunity to analyze one’s own decision-making without being influenced by others.

The facilitated nature of debriefing enhanced the discovering and deepening phases of debriefing. Like others have noted (Decker et al., 2013), we found that skilled facilitators enhanced meaningful, dialogical engagement by helping students navigate diverse peer perspectives and connect theory with practice. The debrief questions facilitated authentic reflection in the SD group, but upon completion, participants were still searching for dialogue and clarification with others. As part of the Debriefing for Meaningful Learning model, Dreifuerst (2015)
recommends a period of self-reflection for learners before they participate in facilitated discussions. Our research expands on this by highlighting the value of SD, followed by group debrief. This approach allows for both authentic self-reflection that is facilitated with a set of debrief questions and exposure to and discussion with other peers and facilitators. It is important to note that SD is more formalized than mere self-reflection because of the use of the carefully designed debrief questions.

Our work highlights the importance of environment to all debriefing formats. Similar to Zigmont et al.'s (2011) work, we found that students require orientation to the debriefing environment. Expanding on this idea, we suggest tutorials when using technology-enabled platforms. Our findings provide empirical evidence supporting Gordon’s (2017) recommendations for small virtual groups to enhance learning. For students who miss the debriefing, Gordon suggests providing one-on-one debriefing sessions. Our study suggests one-on-one sessions may also be valuable for students with unresolved issues after debriefing. Physical comfort, choice, and privacy of location influence participants’ sense of safety and capacity to reflect. Our research adds a layer of complexity to previous studies that highlight the importance of timely debriefs (Hall & Tori, 2017). The summary report initiated students’ reflection before their assigned debrief session which may circumvent the need for immediate formal debriefing.

Survey results related to our research indicated that IP, VD, and SD led to positive debriefing experiences and comparable gains in knowledge and self-efficacy (Verkuyl et al., 2018). Our focus-group results expand on this and highlight the need for research to elucidate how defusing, discovering, and deepening unfold in various debrief formats. A limitation to this study is the voluntary nature of the focus groups which may have resulted in attracting students who had a perceived benefit or positive debriefing experience. Research is needed to examine the nuanced features of facilitation for VD and SD. As a result of our work, we are currently exploring the debriefing process and outcomes when combining SD with facilitated-group debrief.

Conclusion

The expansive uptake of virtual simulation calls for innovative debrief formats and designs in nursing and health professions education. As noted in previous work, the simulation community needs to explore how to leverage the unique features of virtual simulation to design debriefs that promote learning and reflection (Verkuyl et al., 2017b). Our study provides insight into design and implementation of various debriefing formats based on the unique features of virtual simulation.

References


