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Research Article

Advancing game-based learning in higher education through debriefing: Social constructivism theory

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Abstract

Game-based learning has gained increasing attention globally. It is an effective pedagogical approach to promote students' engagement and improve learning outcomes. However, the literature reveals there is a need to strengthen game-based learning, as many students retain only fun of academic games. This study aimed to explore students' experiences on the integration of debriefing in game-based learning at an identified higher education institution in South Africa. The social constructivism theory was utilised as a theoretical lens in this study. The authors employed a qualitative single case study design within an interpretivist paradigm. A purposive sampling strategy was adopted. Six participants were recruited for this study. Data were analysed inductively using thematic analysis. The findings of this study revealed that participants shared positive views and attitudes towards debriefing in game-based learning. They believed game-based learning significantly promoted their studies. The implementation of debriefing in game-based learning assisted them to identify their strengths and weaknesses. Furthermore, the utilisation of debriefing in game-based learning enhanced collaborations and teamwork. This study also highlighted that there was a need to ensure that debriefing was well planned in advance, and that instructors should be competent to conduct debriefing sessions. This study concluded that debriefing is an effective method to advance game-based learning. Further research should be conducted at national and international levels with different research approaches.

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Introduction

In recent decades, game-based learning has gained increasing interest among educators at higher education institutions (HEIs). Shohel et al. (2022) criticise that traditional face-to-face teaching and learning lack practical applications. There is a need to optimise learning outcomes at HEIs, since it is the responsibility of HEIs to ensure that their students acquire the necessary skills and abilities to be competent in the working world (Adipat et al., 2021; Shohel et al., 2022). As explained by Abramovich et al. (2013) and Doyle and Buckley (2013), motivation is one of the core factors that support students' academic success. For this reason, scholars such as Adipat et al. (2021), Hu and Razlog (2023) and Venketsamy et al. (2022) explore diverse pedagogical approaches to improve teaching and learning at HEIs. The author believes game-based learning is an effective approach to enhance learning outcomes by promoting motivation. This view concurs with Jääskä and Aaltonen (2022), who postulate that game-based learning is a pedagogical approach that strengthens teaching

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and learning to promote students' competencies in the world of work. However, Barwani (2014) and Carpenter and Hu (2023) report that despite the efforts made to teach the concepts of development and idea evolution, students retained only the visual aids and the enjoyment they experienced during class. Consequently, there is a need to improve the effectiveness of game-based learning.

The authors identify debriefing to be an option to strengthen game-based learning with the aim to improve learning outcomes. Kim and Son (2022) and Dufrene and Young (2014) agree that debriefing is an effective approach to promote students' academic success. Debriefing refers to a post-experience learning process, which occurs in a form of discussions after specific events (Gardner, 2013; Rao, 2022). Literature reveals there is a lack of research that focuses on exploring the utilisation of debriefing in game-based learning. Therefore, this study aimed to explore students' experiences of debriefing in game-based learning in an acupuncture programme at a South African university. The author employed the social constructivism theory as a theoretical lens to understand students' experiences. In this study, a single case study design within an interpretivist paradigm was adopted.

Literature Review

Game-based Learning

In recent decades, game-based learning has gained increasing attention from researchers, due to its crucial role in enhancing learning outcomes by promoting motivation and students' engagement. Cheng and Su (2012) state that game-based learning places students at the centre of learning activities that promote their engagement with enjoyment. Jääskä and Aaltonen (2022) posit that game-based learning is an important pedagogical approach in 21st-century education. It encourages building knowledge during the learning process through games (Wati & Yuniawatika, 2020). Chan et al. (2021) are of the view that game-based learning promotes students' success through improved learning outcomes. Moreover, Akour et al. (2020) state that through games, students develop multiple skills, including self-evaluation and leadership abilities.

Wati and Yuniawatika (2020) opine that games employed in academic activities should have clear and defined learning outcomes (Hashim et al., 2019). According to Hashim et al. (2019), game-based learning is defined as an approach with well-defined learning outcomes through the application of games in teaching and learning. It is a process of applying games to real-life settings to engage students' learning (Mee et al., 2020). Adipat et al. (2021) emphasise the importance of digital games in the 21st century. Therefore, they define game-based learning as the utilisation of digital games in learning. On the contrary, Plass et al. (2015) argue that games adopted to enhance academic activities do not have to be digital games only, since the key feature of games in game-based learning is to improve learning outcomes by facilitating the learning process.

In this study, games refer to a broader definition that includes any activities that are fun and interesting. Game-based learning is therefore defined as the application of games in teaching and learning to optimise learning outcomes. Mee et al. (2020) concur with Subhash and Cudney (2018) that the fun element in games is the core factor that promotes student engagement in learning. Barwani (2014) articulates that games assist in developing essential skills in the world of work, such as self-evaluation, leadership, teamwork, collaboration, and interaction. Consequently, Thompson and von Gillern (2020) affirm that game-based learning is of profound significance in promoting students' competencies in the world of work. The author believes game-based learning also provides improved learning experiences at HEIs.

Despite the significant role of game-based learning in teaching and learning, Barwani (2014) argues there is a need to explore strategies to support the effective application of game-based learning. The reason cited is that they found that students retained only the fun during games after game-based learning activities in classes. In the author's view, debriefing is an effective approach to promote game-based learning. This view agrees with Bilgin et al. (2015), who reveal students shared positive views and experiences of debriefing in their studies. Similar sentiments have been expressed by Shinnick et al. (2011), who report that students' performance is significantly improved with the utilisation of debriefing in games. Nicholson (2012) argues that without debriefing sessions, the effectiveness of game-based learning is greatly reduced. The reason being that it might be a challenge for students to connect academic games and knowledge by

themselves. According to Bilgin et al. (2015), it is crucial to ensure appropriate durations of debriefing sessions, which should not be too long.

Value of debriefing in advancing game-based learning

Scholars, such as Abegglen et al. (2022) and Rao (2022), believe that ensuring students' competencies through debriefing is crucial. In their work, Kolbe et al. (2019) articulate that debriefing significantly promotes students' competencies in the world of work. One of the reasons is that debriefing is an effective pedagogical approach to strengthen students' critical thinking (Dreifuerst, 2015). The use of debriefing in game-based learning facilitates students to link academic games to insights (learning outcomes). Van der Meij et al. (2013) affirm that debriefing encourages students to reflect on learning through games. Furthermore, there are several benefits of implementing debriefing in teaching and learning. For instance, debriefing enhances collaboration, teamwork, and communication skills, which are essential skills in the working world (Johns & Moyer, 2017).

Gardner (2013) explains that debriefing is a pedagogical approach that employs self-reflection after specific academic activities. Fanning and Gaba (2007:116) define debriefing as a process that "facilitated or guided reflection in the cycle of experiential learning". According to Rao (2022), debriefing promotes students' active engagement in the learning process through the implementation of pre-designed discussions for specific topics. It encourages an in-depth understanding of phenomena that students can apply in similar circumstances in future (Cheng et al., 2014; Fanning & Gaba, 2007). Cheng et al. (2014) further explain that students are able to identify their strengths and deficiencies by themselves during debriefing. Therefore, Abegglen et al. (2022) opine that debriefing effectively improves learning outcomes through formal or informal post-activity discussions. In this study, debriefing refers to discussions on specific topics during or after games in classes (game-based learning activities).

According to Dufrene and Young (2014), debriefing was developed from the concept of reflective thinking, proposed by John Dewey in 1910. It was further expanded to encourage students to reflect during and after academic activities, namely reflection-in-action and reflection-on-action (Schön, 1983). Due to the significant role of debriefing in teaching and learning, Gardner (2013) points out that there is a need to ensure effective debriefing. To conduct debriefing effectively, Fanning and Gaba (2007) and Rudolph et al. (2006, 2007) all concur that debriefing should be conducted immediately after activities. The author agrees with Bilgin et al. (2015) that debriefing should be integrated into game-based learning to promote learning outcomes. Stansbie et al. (2016) claim that facilitators should have an in-depth understanding of the aim and process of debriefing, and the ability to engage students (Cheng et al., 2014). Facilitators should constantly strengthen their skills in guiding discussions during debriefing by reviewing academic activities and self-reflections (Abegglen et al., 2022; Gardner, 2013).

The process of debriefing involves three stages, which are the reaction stage, the understanding stage, and the summary stage, according to Gardner (2013). The reaction stage takes place immediately after an activity. In the author's opinion, the reflection stage provides facilitators with an opportunity to obtain an in-depth understanding of students' experiences. This view concurs with Kolbe et al. (2019), who state that the initial reflections offer a valuable opportunity for facilitators to obtain authentic sentiments from students. The reaction stage is followed by the understanding stage, which is considered the core component of debriefing. Facilitators gain deeper insights into students' experiences through interactions and observations during discussions (Rudolph et al., 2007). The author believes that the reaction and understanding stages offer facilitators a chance to cognitively detect students' experiences, which further allows them to provide precise feedback to students according to their performances. Debriefing activities share the benefits of providing reflection time, as well as an opportunity for students to interact (Gardner, 2013; Kim & Son, 2022). Rao (2022) highlights the significance of the last stage of debriefing, namely the summary stage. The summary stage enhances students' impressions and knowledge gained in the debriefing sessions (Kolbe et al., 2019). Therefore, it is of profound importance to provide students with takeaway notes after debriefing sessions (Gardner, 2013). The author is of the view that debriefing is an effective pedagogical approach to strengthen the value and effectiveness of game-based learning at HEIs.

To conduct debriefing effectively and successfully, facilitators should ensure that the learning environment is conducive physically and psychologically. A psychologically conducive learning environment refers to a situation where students feel respected (Kolbe et al., 2019). This view is further supported by Rao (2022), who emphasises the manner in which feedback is provided. According to Cheng et al. (2014) and Rao (2022), feedback should be made without shaming, blaming, or criticising, which will encourage students to be active in debriefing sessions. Moreover, to provide a physically conducive learning environment, debriefing sessions should be conducted in a private room, where the confidentiality of students can be ensured (Kolbe et al., 2019). In the authors' opinion, it is crucial that facilitators must provide a psychologically safe learning environment for students, where they feel supported and respected at all times. According to Rao (2022), the safety principles for debriefing include a) respect for your students, b) respect for your own knowledge and expertise, and c) the importance of asking thought-provoking questions and paying attention to the answers.

Technologies, such as online teaching and learning, are useful tools to improve learning outcomes in 21st-century education. This is of particular significance in Africa, where there is a lack of resources among African HEIs (Carpenter & Hu, 2023; Venketsamy et al., 2022). Bilgin et al. (2015) report that both physical and online debriefing are effective in enhancing learning outcomes. The author agrees with Bilgin et al. (2015) that employing technologies in education notably improves the effectiveness of debriefing. According to Gardner (2013) and Kolbe et al. (2019), students are required to analyse, synthesise and evaluate particular situations during debriefing. The purpose is to allow students to apply lessons and experiences from academic games in similar situations (Nicholson, 2012). Fanning and Gaba (2007) are of the view that debriefing in games can be conducted with or without a facilitator. However, Dufrene and Young (2014) point out there is a need to conduct more studies on different methods of conducting debriefing. It is also important to allocate an appropriate time for debriefing in games (Nicholson, 2012). Similar sentiments are expressed by Kolbe et al. (2019) and Shohel et al. (2022), who argue that instructional practices, intense competition, and timekeeping of games may be the barriers to the implementation of game-based learning. In debriefing sessions, instructors should recognise their role as facilitators instead of leaders during discussions (Shohel et al., 2022).

To implement debriefing effectively, Bilgin et al. (2015) suggest that it should be integrated during gaming activities, when it will be easier for students to recall the situations, than during post games debriefing. On the contrary, Van Heukelom et al. (2010) argue that debriefing should be conducted after games, since neither games nor debriefing should be interrupted. They believe uninterrupted debriefing improves students' academic performance. Moreover, Nicholson (2012) points out there is a lack of research on the timing factor in debriefing.

Theoretical Framework

The theoretical framework anchored in this study was the social constructivism theory. According to this theory, students construct and develop their own understanding through lived experiences (Ertmer & Newby, 2013). The social constructivism theory was developed by Lev Vygotsky (1962). According to Vygotsky (1962), social interaction plays a crucial role in learning. In his work, Vygotsky (1962) explains that the entire learning process takes place within social life. Therefore, he contends that all learning occurs between what students can do by themselves and what they can do with assistance, which is defined as the zone of proximal development (Burhanuddin et al. 2021). Researchers with the viewpoint of social constructivism do not agree that learning is simply the assimilation and accommodation of new knowledge by learners, in other words, merely a process of adjusting their mental models to accommodate new experiences (Ertmer & Newby, 2013). Social constructivists believe that social and group interactions benefit the development of an individual's meaning and understanding (Muhajirah, 2020). On a similar note, Ramsook (2018) explains that a constructive classroom is cooperative.

In a constructive classroom, students are encouraged to participate in academic activities that can be supported by facilitators. Both Piaget and Vygotsky are of the view that students should be able to obtain knowledge from their own experiences through the process of learning activities (Burhanuddin et al. 2021). Therefore, it is of importance that learning takes place in a real-world setting. Furthermore, academic activities should be relevant to student's previous knowledge and experiences. According to the social constructivism theory, students construct knowledge to identify

and solve problems by themselves (Kitiashvili, 2020). Muhajirah (2020) suggests that students do not transfer knowledge from the external world to their memories. They rather develop personal interpretations of the world, based on individual experiences and interactions. Students are motivated to be self-aware, self-facilitated and self-regulated through the constructive learning process (Kitiashvili, 2020). Ramsook (2018) propounds that students will acquire knowledge from each other when learning in groups. Both student and environmental factors are critical to the social constructivist, as it is the specific interaction between these two variables that create knowledge (Ertmer & Newby, 2013).

Research Problem

Social constructivists do not deny the existence of the real world but contend that what we know of the world stems from our interpretations of our experiences (Muhajirah, 2020). According to social constructivism, the learning process is the construction of meaning from experiences with the focus being the learning process, instead of remembering knowledge and emphasising learning outcomes (Burhanuddin et al., 2021). In the author's opinion, both debriefing and game-based learning are effective constructive approaches to strengthen learning outcomes. Therefore, through debriefing in game-based learning, students are able to identify their strengths and weaknesses by themselves. In this study, the authors asked the research question:

- How do students experience debriefing in game-based learning?

Method

Research Design

In this study, a qualitative approach within an interpretivist paradigm was employed to explore students' lived experiences on the use of debriefing in game-based learning in the acupuncture programme at an identified HEI. In the acupuncture programme, a set of student-centred academic games were proposed and designed by students. The purpose of the activities was to promote students' understanding of acupuncture content knowledge, improve their confidence and encourage them to engage with fellow students. Debriefing occurred both during and after each game. In the authors' opinion, a qualitative study design was suitable for this study since the purpose of this study was to explore students' lived experiences. This view agrees with Hu (2022) and Venketsamy et al. (2022), who indicate that qualitative studies focus on exploring participants' understanding, characteristics, and experiences. The research setting of this study was an identified public university in Gauteng province which provided acupuncture programmes. A single case study design was adopted for this study, since the identified HEI was the only university that offered acupuncture programmes in South Africa. Furthermore, the author concurs with Hu and Venketsamy (2022) and Yin (2018) that a single case study should be employed when a case is critical, unusual, common, and relevant to the researcher. The selected case was critical because the author believed that optimised learning outcomes were critical in the identified acupuncture since a high failure rate was noted. The selected case was unusual due to the fact that it was the only accredited acupuncture programme in South Africa. It is also a common phenomenon as optimising learning outcomes is a common requirement for all educational programmes at HEIs. The selected case was also relevant to the authors because they had access to the identified HEI.

Participants

Hu and Venketsamy (2022) and Maree (2020) point out that a purposive sampling technique is valuable when there is a limited population. Therefore, the author employed a purposive sampling strategy to recruit participants for this study. A research invitation poster was displayed on a noticeboard on the identified campus. Students who contacted the researchers (authors) and met the inclusion criteria, were invited to participate individually in semi-structured interviews. The inclusion criteria included: a) students had to be registered for the Bachelor's Degree of Health Sciences in Complementary Medicine; b) participants had to participate in the debriefing sessions during the game-based learning activity, c) participants had to be above the age of 18, and d) participants had to express their willingness to voluntarily

participate in the study. Six students gave their consent to voluntarily participate in this study by signing a research consent form.

Table 1. Biographical data of participants

No	Gender	Age	Codes
1	Female	24	P1
2	Male	22	P2
3	Female	21	P3
4	Female	22	P4
5	Male	22	P5
6	Female	23	P6

Data Collection Tools

The semi-structured interviews took place between February and March 2023. Prior to the interview, the interview schedule (Appendix A) was reviewed by three experts to ensure the trustworthiness of the interview questions. The interview questions were amended according to the expert panel members' comments. The authors thereafter recruited two participants to pilot the interview schedule (pilot study). Data from the pilot study were excluded from the data analysis of this study. Table 1 above depicts the participants and the respective codes used in the data analysis. To ensure confidentiality and anonymity, pseudonyms were used throughout the research.

Data Analysis

In this study, the author employed thematic analysis, proposed by Creswell (2014) to analyse data. Hu et al. (2022) and Venketsamy et al. (2021) state that thematic analysis is an appropriate approach to analyse qualitative data, since it assists in identifying similarities and dissimilarities of opinions between participants. Furthermore, Hu et al. (2022) agree with Yin (2018) that thematic analysis is effective in identifying significant perspectives in research findings. Subsequently, the author followed the six-step thematic analysis proposed by Creswell (2014) to analyse the raw data systematically. The data were analysed inductively. The author reviewed the raw data several times to become familiar with it (Step 1). The author thereafter started to code the data (Step 2) and identified initial themes (Step 3). The initial themes were reviewed (Step 4) and refined (Step 5). In the end, the author used these codes and themes to answer the research question. To ensure the trustworthiness of this study, the author employed multiple techniques to improve the credibility, conformability, dependability, and transferability of the findings. These techniques included a well-planned research design and research methods, thick descriptions of data, and an audit trail that was audited by a second coder.

Ethical consideration

Ethical concerns were ensured. An ethical approval letter was obtained from a research committee at a public university in Gauteng province (Ref: REC-1443-2022).

Results

This study explored students' experiences of debriefing in game-based learning in the acupuncture programme at the identified HEI in South Arica. Participants reported positive attitudes and experiences of game-based learning in the acupuncture programme. They indicated that game-based learning promoted their engagement in the study and teambuilding among fellow students. Moreover, they revealed that debriefing significantly assisted them in clarifying important perspectives in the study. However, some participants believed a more structured approach was needed to implement debriefing in game-based learning successfully. They contended that well-planned debriefing would improve the effectiveness of debriefing in game-based learning. Two themes emerged from raw data during the data analysis, namely: i) Students' views and attitudes toward debriefing in game-based learning; and ii) Challenges of debriefing in game-based learning. Verbatim quotes were included in the section below.

Theme 1. Students' views and attitudes toward debriefing in game-based learning

The findings of this study revealed that participants acknowledged that debriefing significantly strengthened the value of game-based learning in the acupuncture programme. They highlighted that debriefing during the games assisted them in identifying misconceptions and promoting their critical thinking. P1, P2, P4 and P5 all agreed that debriefing successfully increased their confidence in the working world because they would be able to apply the knowledge clarified and gained during debriefing to a similar situation in future. P3, P5 and P6 indicated that debriefing during game-based learning greatly reduced their stress, compared to debriefing sessions in the clinic. P1 said: "*The discussion during the games is extremely helpful because you realise where you went wrong in your own thinking with assistance from the facilitator*." P3 added: "*Sometimes it was difficult for me to find my own mistakes. After each game, the facilitator discussed key content knowledge in the games which I believed was very useful*." P4 indicated:

> *I like the discussion sessions during game-based learning. It does not feel like it in the class. You can express whatever you think while still having a lot of fun. All fellow students were free to talk without any pressure. Particularly, you will have a relaxed mood when playing games*.

P5 added: "*During the discussion, I realised where I went wrong when answering the quizzes [in the games]*." P6 said:

> *Apart from the games, the discussion session was also interesting and beneficial. It seemed that the facilitator could see where I went wrong in my critical thinking during games. When he probed into my deficiencies, I gained a deeper understanding of the content knowledge. I enjoy recognising my own mistakes*.

In her response, P6 said: "*I like the discussions in the games. I learned the most from the discussions. I feel more competent and confident when I encounter similar situations in future as I know it is correct*!"

Theme 2. Challenges of debriefing in game-based learning

Despite all participants agreeing on the important role of debriefing in game-based learning, some participants pointed out that there were some areas that could be improved. For instance, there should be more experienced facilitators who facilitate the debriefing sessions. The reason was that some facilitators failed to respond and explain questions that were not in the memorandum. P2 indicated: "*During the discussion session, the facilitator gave an incorrect hint which led to the dead end of the critical thinking*." P3 added: "*I felt frustrated when the facilitator contradicted himself and corrected himself after a long discussion.*" Moreover, some participants reported that some debriefing sessions were too long. P3, P4 and P6 all concurred that appropriate time should be allocated for debriefing. To this, P6 explained: "*I could not concentrate for such an extensive discussion. Especially, sitting under the sun and answering questions during the discussion*."

Summarily: Graphically

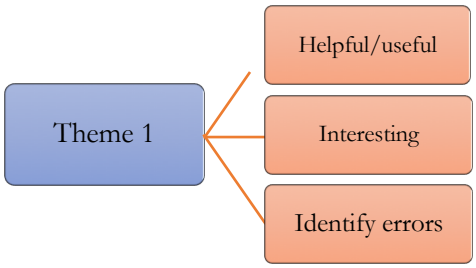

Figure 1. Codes of Theme 1: Students' views and attitudes toward debriefing in game-based learning

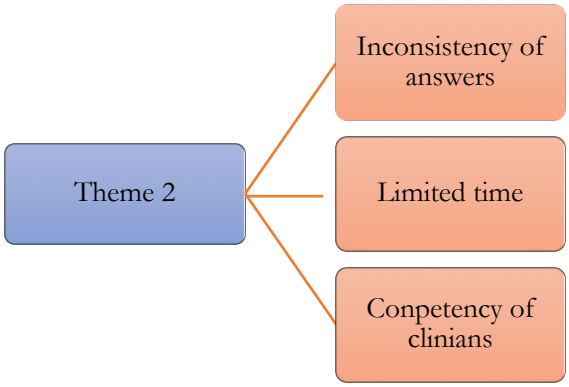

Figure 2. Codes of Theme 2: Challenges of debriefing in game-based learning

Discussion

Literature reveals that game-based learning is an effective pedagogical approach at HEIs (Bilgin et al., 2015). The findings of this study agreed that game-based learning promoted student learning by improving motivation and engagement. Participants in this study revealed that applying games in the acupuncture programme was interesting and beneficial. Evidence can be found in P2's response, "*It is amazing that I am actually learning while playing games with my fellow students*." The findings of this study also support Barwani (2014), who contends that game-based learning promotes students' skills in self-evaluation, leadership, and teamwork. In the author's opinion, game-based learning offers students an opportunity to construct and develop knowledge from what they know. According to the social constructivism theory, social interaction is of profound significance in constructing knowledge (Ertmer & Newby, 2013; Muhajirah, 2020; Ramsook, 2018). The study suggested that debriefing in game-based learning effectively improved students' engagement in learning activities.

Abegglen et al. (2022), Kolbe et al. (2019) and Rao (2022) concur that debriefing significantly optimises students' competencies in the working world, because it is an effective approach to improve students' critical thinking and problem-solving skills (Dreifuerst, 2015). Participants in this study shared a positive view and attitudes towards debriefing in game-based learning. They indicated that debriefing during games assisted them to clarify misconceptions in learning. Moreover, debriefing in game-based learning offers an opportunity for students to identify their strengths and deficiencies. For instance, P3 said: "*I noticed my shortage in my critical thinking through the discussion with facilitators. I saw where I went wrong when I analysed a particular situation.*" P5 added: "*The discussion helped me to find my weaknesses in the study. I recognised what I did not know even though I thought I knew initially.*" The authors believe it is of significant importance to integrate debriefing during or after academic games in game-based learning. The reason is that debriefing promotes students' self-evaluation and awareness in the learning process. This view is supported by Abegglen et al., (2022), Johns and Moyer (2017) and Van der Meij et al. (2013). They all agree that students develop diverse skills through debriefing. In their work, Burhanuddin et al. (2021) and Muhajirah (2020) reveal that students are able to construct new knowledge from their experiences. The authors contend that it is of particular significance when there is an instructor facilitating the learning. This is how a typical constructive classroom should be conducted (zone of proximal), according to Burhanuddin et al. (2021) and Plass et al. (2015).

The findings of this study highlighted the critical role of debriefing in game-based learning in promoting students' skills in communication, team building, and collaboration. Participants revealed that group debriefing in game-based learning encouraged them to work as a group and helped each other. P4 stated: "*We need more of this kind of activities for team building as a class*." P6 added: "*This is the first time we, as an entire class, felt we are helping each other. We built a closer relationship with our classmates*." Akour et al. (2020) and Barwani (2014) articulate that through debriefing in game-based learning enhances students' engagement and collaboration. Participants in this study did not report any issues with regard to the conducive environment. Students did not feel physically or psychologically unsafe while answering questions in debriefing. This supports Cheng et al. (2014), Kolbe et al. (2019) and Rao (2022), who emphasise the importance of ensuring students feel safe during the entire process of academic activities.

Kolbe et al. (2019) and Rao (2022) believe that a safe environment is achieved through the use of a private room and a friendly manner when providing feedback. The author agreed that it is crucial to ensure a conducive learning environment. The reason that students in this study did not feel unsafe, even though the discussions took place in a public area (school library parking), is that the debriefing was effectively integrated into the academic games where students felt relaxed. The author argues that it is crucial for HEIs to provide a friendly learning environment for their students. This view is supported by social constructivist researchers who emphasise the influence of social interaction in enhancing the learning process (Muhajirah, 2020; Vygotsky, 1962). This study also pointed out the importance of competent instructors in debriefing sessions. The authors are of the view that HEIs should ensure academic staff acquire adequate pedagogical skills to conduct successful debriefing sessions.

Conclusion and Recommendations

It is crucial for HEIs to ensure their students are competent in the world of work. Therefore, it is necessary to explore diverse effective pedagogical approaches at HEIs to meet the requirements for 21st century education. Game-based learning is a valuable approach to promote students' engagement (Wati & Yuniawatika, 2020). The authors agree with Bilgin et al. (2015), who are of the view that integrating debriefing in game-based learning will strengthen learning. The findings of this study suggested that debriefing enhanced student learning in game-based learning. Debriefing is an effective approach to strengthen students' critical thinking and problem-solving skills, which are essential in the working world.

Social interactions play an important role in all learning processes. Students construct knowledge through their experiences from interactions with others (Kolbe et al., 2019; Muhajirah, 2020). Debriefing in game-based learning provides an opportunity for students to interact with fellow students. Based on the findings and discussion of this study, the following recommendations are proposed:

- Game-based learning is an innovative approach to strengthen students' engagement, which further optimises learning outcomes. It is recommended that game-based learning should be employed in teaching and learning at HEIs.
- Debriefing effectively strengthens critical thinking (Rao, 2022; Gardner, 2013). It is recommended that debriefing should be integrated into game-based learning to optimise the outcomes of academic activities.
- It is further recommended that HEIs should provide a friendly learning environment for their students, particularly for debriefing in game-based learning. Feedback should be provided in an appropriate manner (Kolbe et al., 2019).
- Further research is recommended to be conducted at national and international HEIs to evaluate the value of debriefing in game-based learning. Diverse research approaches should be utilised, such as quantitative and mix methods research.

Limitations of the Study

This study was limited to explore students' experiences of debriefing in game-based learning at one HEI in SA. The reason was that the identified HEI was the only university in SA that provided an acupuncture programme. Therefore, the findings of this study lacked comparisons, which limited the generalisation of the findings. Although a qualitative approach was used in this study, the author believes that it was not the only valid method to explore this phenomenon. The subjective interpretation brought by the interpretivist paradigm also was seen as a limitation..

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Appendix A. Semi-structured interview schedule

Interview questions (The questions below are adaptable.)

Discussion point 1: Introductory question

- What is your general understanding of game-based learning?

Discussion point 2: Introductory question

- What is your general understanding of debriefing?

Discussion point 3: Main discussion

- Describe your views and experiences of debriefing in game-based learning session?

Discussion point 4: Main discussion

- What are the challenges of debriefing in game-based learning sessions?