


Digital Gaming for Cross-Cultural Learning: Development of a Social Constructivist Game-Based Learning Model at a South African University

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ABSTRACT

Although game-based learning has gained significant attention in higher education globally, it is difficult to harness its engagement and interactions to improve student success. This paper argues that the use of digital games has the potential to interrupt social practices and increase engagement and interaction, thereby fostering meaningful learning. Using a mixed-method design, a digital game was used in a sport studies programme, involving 106 participants, over a two-year period. Data were collected through surveys, focus group discussions, and reflective blog posts. Structuration theory is considered as the theoretical lens, as it purports that recursive social activities of humans are continually recreated by human agents. The paper concludes that when participants engaged in a cross-cultural game-based learning environment, the social practices acquired through their academic career were interrupted, reshaped, and reproduced into new practices. A social constructivist game-based learning model to foster interaction within multi-cultural higher education classrooms is offered.

KEYWORDS

Cross-Cultural Learning, Game-Based Learning, Mixed-Methods, Social-Constructivism, Sport Studies, Structuration Theory

INTRODUCTION

In this study, the authors assert that the historical legacy of segregation during apartheid in South Africa has been indoctrinated into the unconscious minds of students in higher education, as evidenced by their interaction with peers in a multicultural classroom setting. The Council for Higher Education (CHE, 2012) asserts that although the demographic profile of universities has changed, the participation for diverse racial groups still differs. Material inequality, segregation, and socio-historical factors influence the potential of higher education institutions to facilitate the development of citizenship (Leibowitz, 2012). Anecdotal evidence highlighted that students in a sport-studies class were not engaging with peers from different cultures but instead were situating themselves with peers of the same cultural group. Giddens (1984) connects the unconscious to memory, which affects the day-to-

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day actions and interactions of individuals, consequently organizing memory from the past in relation to the present (Giddens, 1996).

Although apartheid policies have been abolished, traces of the legacy of segregation are still, inadvertently, manifested in the behaviors of students of modern higher education institutions. Current students, commonly referred to as “born-frees” (Kane-Berman, 2015), did not experience the trauma of apartheid themselves; however, they still exhibit poor success and throughput rates in the higher education system (Republic of South Africa, Department of Higher Education and Training, 2019; Scott et al., 2007). While literature reveals that student engagement is linked to student success (Strydom et al., 2010), an explanation of cross-cultural engagement falls short in the South African context, which limits the understanding of interaction in a cosmopolitan classroom. Therefore, it is the contention of the authors that, while operating in groups with cultural similarities, knowledge is produced in homogeneous cultural groups and not shared across cultural groups.

For the purposes of this paper, groups with cultural similarities will be called cultural clusters. These cultural clusters hinder cross-cultural interaction of students in the classroom. However, it is possible that the use of digital games may offer conditions that could reshape social actions related to cross-cultural interaction as the affordances of emerging technologies, such as digital games, are perceived to foster engagement and interaction (EDUCAUSE, 2014; Veletsianos, 2010; Bower, 2008). Digital games, therefore, may have potential to increase cross-cultural interactions. The research reported is part of a larger study that used the emerging technologies of digital games, wikis, and blogs to explore how cross-cultural interactions are produced and reproduced in a sport-studies classroom at an institution of higher learning in the Western Cape province of South Africa. Therefore, this study seeks to answer the research question: how does the implementation of a digital game foster cross-cultural engagement and interaction in the classroom? This study offers a social-constructivist game-based learning model to foster cross-cultural engagement and interaction within multicultural classrooms in sport studies.

GAME-BASED LEARNING, SOCIAL CONSTRUCTIVISM, AND STUDENT ENGAGEMENT

Game-based learning (GBL) may be defined as activities or games that are used in the classroom to improve learning, while gamification is defined as the use of game-design elements in non-game contexts (Wiggins & Simkowski, 2014). GBL could be considered as the nexus between curricula, learning theories, and digital games with the main aim of improving student success and enhancing the learning experience (Dahalan et al., 2023).

Furthermore, Bhat et al. (2023) indicate that a game-based learning environment not only enhances student experiences but also ensures that students get feedback on their learning, and it provides educators insight into the performance of their students. Additionally, a context-specific GBL approach allows students to engage in a meaningful and interesting practical environment that may have an improved impact on learning (Lin et al., 2018).

With the increasing popularity of mobile devices such as tablets and smartphones, the proliferation of GBL in the higher education space is fast becoming a key instrument to provide innovative learning opportunities for students (Giannakas et al., 2018). Although GBL is regarded as an innovative tool to facilitate students’ active participation and engaged learning, it also embodies powerful principles of learning that educators might do well to emulate (Lin et al., 2018; Chen et al., 2012).

One of the affordances of digital game-based learning lies in the element of competition, which has the potential of engaging players on an emotional and cognitive level that has a significant impact on learning and motivation (Jabbar & Felicia, 2015). Hamari et al. (2016) assert that the constructivist nature of using digital games lies in the affordance to mediate scaffolding and support. This sentiment is echoed in the research of Eseryel et al. (2014), who reiterate the importance of the design of a GBL environment to scaffold students’ motivation and engagement.

Student engagement is considered to be a proxy for student success and retention within the South African higher education sector (Schreiber & Yu, 2016). In South Africa, student engagement has been identified as an important indicator of student success and is useful in understanding students' perspectives of their learning experiences in higher education settings (CHE, 2010). Consequently, student engagement is defined as the "time and energy students devote to educationally purposive activities and the extent institutions employ effective education practices to induce students to do the right thing" (Strydom et al., 2010, p. 10). Wong and Chapman (2022) indicated that interaction is a key predictor of student satisfaction in higher education. Thus, given the social-constructivist nature of this project, social interaction is therefore considered in two forms, namely, student–student and student–lecturer interactions (Wong & Chapman, 2022).

From a constructivist's perspective, the implementation of digital games may allow a generation of new knowledge. In addition, the development of new skills may affect the development and production of new social norms, which may improve how students from different cultural and ethnic backgrounds interact with one another in the classroom, hence referred to as cross-cultural interaction. Overall, game-based learning could be a powerful tool that could promote cross-cultural interaction, collaboration, and engagement. Wu et al. (2011) suggest that the connection between learning theories and game-based learning is still vague. In this study, therefore, authors attempt to fill the void in the theoretical understanding of game-based learning by applying socio-constructivist learning theories in order to develop a game-based learning model.

CROSS-CULTURAL INTERACTION AND ENGAGEMENT: A STRUCTURE AND AGENCY PERSPECTIVE

It is the authors' contention that the actions and interactions of students in a sport-studies classroom are repetitive and that the social practice tends to unconsciously influence students (for example, an affinity to gather in homogeneous groups that are representative of their own culture). Additionally, classroom observations show that these actions are created by students who, through their actions, reproduce conditions that make these activities possible. Structuration theory provides a way of understanding the production and reproduction of social action in cross-cultural interactions of students. As researchers, we argue that digital games enhance cross-cultural interactions by disrupting the unconscious (individual) reproduction of homogeneous formulations in a multicultural sport-studies program (society). Structuration theory focuses on the association between individuals and society (Jones & Karsten, 2008).

Steinkuehler and Williams (2006) assert that exposing people to virtual online environments allows the individual to experience diverse world views and form meaningful social relationships. Thus, there are varying approaches to understanding how games can be used within different contexts. This being said, the connectivity Steinkuehler and Williams allude to is useful in the cosmopolitan South African classroom because until 1994, the apartheid system of education was segregated along the lines of race and ethnicity, thereby invariably disadvantaging historically Black institutions of learning. This historical phenomenon has created a challenging space for post-1994 policy (McKeever, 2017; Badat, 2009) because it would require context-specific approaches that take into consideration the circumstances of various historically disadvantaged groups in order to achieve broader representation (Boughey & McKenna, 2021; Henrard, 2002). Due to these institutional histories, it is essential to create learning opportunities, such as GBL, that affect redress-centered developmental strategies and act as connectors between the different social and ethnic groups.

Fuchs (2003) explains that human social activities are recursive, as they are recreated continually by human actors/agents. In addition, social reality is produced, either by the individuals themselves or by social forces (Alanezi, 2007). Various authors concur with Giddens (1984) that structure and agency are dichotomous and mutually reliant (Jones & Karsten, 2008; Alanezi, 2007; Fuchs, 2003). Therefore, the social phenomena that are observed in society are a product of both structure and

agency, where human agents invoke social structures in their actions while simultaneously producing and reproducing the same social structure (Jones & Karsten, 2008). Giddens (1984) further argues that society evolves from human agency that is based on knowledge, intended goals, and planning. Individuals act within social structures that have a distinct set of social norms and rules. These social norms and rules are produced and reproduced through interactions that are mitigated by individuals in society. Therefore, the process of structuration may be viewed as an interplay of meanings, norms, and power (Alanezi, 2007).

Structuration theory has been used to emphasize the composition and re-composition of social practices, as revealed by Pozzebon and Pinsonneault (2005). Giddens's manner of positing the mediating capacities of social structures, as an outcome of human action and agency, is a valuable point of departure in social contexts (Englund & Gerdin, 2008). Giddens attempts to integrate human agency, social structure, social systems, and social institutions (Chang, 2014; Jones & Karsten, 2008; Alanezi, 2007; Tucker, 1998; Giddens, 1984). For the purposes of this paper, human agency and social structure take into consideration the way students may interact (structure) in a multicultural classroom based on rules and resources in the classroom. Social structure and social institutions refer to students' social actions and activities, which are based on prior knowledge and experiences in an existing social system. This continuous repetition of human practices and interaction could be manifested in cross-cultural interaction/engagement. Therefore, in regard to material resources such as digital games, the real affordances of the technology and its outcomes arise from the actions of human agents (Pozzebon & Pinsonneault, 2005).

METHODOLOGY

This study adopted a sequential exploratory mixed-method approach. All the students were invited to participate and interact in the digital game based on the learning environment. This study was conducted in two phases. The interventions for Phase 1 and Phase 2 took place in the second semester (14 weeks) over a period of two academic years with two separate cohorts. Phase 1 comprised a digital game-based intervention only with Cohort 1. Phase 2 comprised a game-based learning intervention, an authentic task, and a reflective blog with Cohort 2. Similar to many other modules in this program, it was originally presented using a didactic approach where the lecturer predominantly provided a lecture and the content, with very little student interaction and engagement. The module consisted of 14 weeks of instruction and tutorial assistance in a blended learning environment, including digital gaming. In both terms, students received a one-hour lecture and a one-hour tutorial on content related to sport psychology. During the semester, the game-based learning interventions for both phases were infused into the learning and teaching of the module. Consequently, 106 participants, from a total population of 171 students, participated in the study over a period of two years.

Data Collection

First, baseline quantitative data were collected in Phase 1 and Phase 2 to assess students' status of use of digital games and educational technologies and to explore their level of interaction and cross-cultural student engagement in the classroom. Following this, the students were randomly placed into groups. From the random list, generated by Microsoft Excel, students were placed into groups of five; each group was assigned a login and password. Each group played a self-developed online game against other peer groups for the duration of the class. The digital-game intervention took place over four structured lessons. After the second and third lessons, two focus-group discussions were conducted during Phase 1 with eight participants each, and three focus-group discussions were conducted during Phase 2 with the same number of participants. The purpose of the focus-group discussions was to explore students' experiences playing a game across cultures and to interrogate issues pertaining to cross-cultural engagement. At a theoretical level, classroom habits (interactions) prior to and post-implementation were explored.

During Phase 1, 94 students played the digital game and 64 voluntarily agreed to complete the baseline survey. By the end of the intervention, 42 participants remained in the study and completed the post-intervention survey. During Phase 2, 77 students engaged with the digital game and 42 voluntarily agreed to complete the baseline survey. By the end of the intervention, 43 participants remained in the study and completed the post-intervention survey. The quantitative data consisted of validated, modified pre- and post-test questionnaires by Rowe (2012). The qualitative data were collected in the form of focus-group discussions and reflective blog posts. In addition to the five focus-group discussions mentioned above, 57 reflective blogs were gathered. For the purposes of this study, when collecting qualitative data, triangulation, rich thick description, member checks, clarification of researcher bias, and peer review, as highlighted by Creswell (2009), were adopted. Ethical clearance for the current study was obtained from the institution.

The quantitative instrument comprised seven sections. These sections measured their access to the internet, their participation and understanding of digital gaming, their level of engagement, their participation in social networking and use of technologies for learning, their studying preferences, the teaching within their department, and finally their demographic information. The questionnaire was validated by Rowe et al. (2013) and further piloted and modified for the purpose of this study. The coefficient used to measure internal reliability of the questionnaire was Cronbach's alpha coefficient. The questionnaire instrument yielded an alpha of 0.8, which is acceptable.

Data Analysis

Data were analyzed qualitatively and quantitatively within the sequential mixed-method approach. Phase 1 and Phase 2 consisted of two sets of quantitative data. This included a pre-intervention baseline survey and a post-intervention survey. The survey instrument data were coded, cleaned (using a MATCH formula), and captured on Microsoft Excel, after which they were imported into the Statistical Package for the Social Sciences (SPSS Version 20) in order to run analyses on the clean data. Descriptive statistics were run on the data set, which included means, modes, and standard deviations.

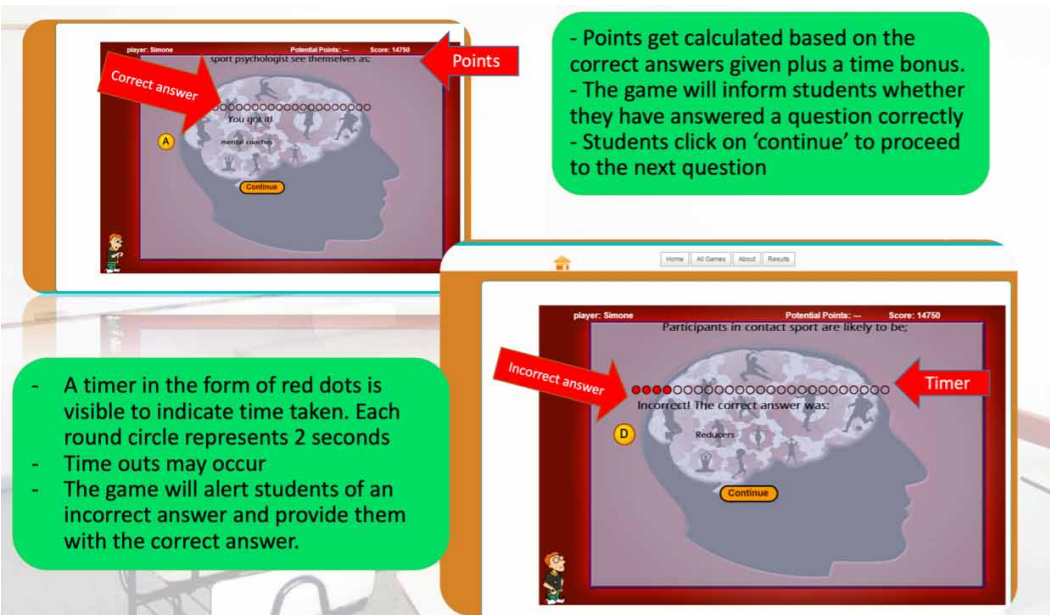
Phase 1 used a paired *t*-test on pre-intervention versus post-intervention data ($p < 0.05$) with a confidence interval of 95% on the student-engagement scale, learning-preferences scale, and online-confidence scale. Phase 2 used a paired *t*-test on pre-intervention versus post-intervention data ($p < 0.05$) with a confidence interval (CI) of 95% on the student-engagement scale, learning-preferences scale, and online-confidence scale. An independent *t*-test was run on the data sets between the cohorts. In addition, a repeated-measures ANOVA was run ($p < 0.05$) with a confidence interval of 95% on the student-engagement scale, learning-preferences scale, and online-confidence scale.

Focus-group data from Phase 1 and Phase 2 were transcribed verbatim in English in Microsoft Word. All transcripts were imported into ATLAS.ti Version 8.1.27 for analysis. Transcripts were read several times by one of the researchers, after which they were coded, using open coding, and analyzed. A thematic analysis from the focus-group discussions using Braun and Clark's (2006) six steps for thematic analysis was performed. Here, similar information was grouped together into narrative clusters and analyzed using ATLAS.ti. Data were coded and analyzed both inductively and deductively. Deductive analysis was done by placing similar words or phrases together that related to specific questions that were of similar ideas. Inductive analysis was conducted by placing ideas together that were specific to structuration theory and authentic learning, as part of the theoretical framework adopted in this study. Similar or related ideas were grouped together into thematic categories. These categories were then synthesized into a narrative summary. The narrative summary is aimed at reflecting on the experiences of participants regarding the use of digital games in the classroom.

Research Setting: Digital Game

An interactive digital quiz game was designed based on topics covered in class as well as the prescribed textbook. The game required teams, made up of randomized multicultural groups, to correctly answer as many quiz questions as possible within 45 seconds, which was run off a timer. For each game

Figure 1. Example of the digital game



round, a leader was assigned in the group to control the game and read the questions. All group members assisted in answering the questions. The groups that answered the most questions correctly scored the most points. Each gaming round/session lasted for approximately seven minutes, after which there was a leadership rotation and a new leader was selected, until each member had had a leadership opportunity. The digital game was implemented in four lectures across the semester, and in each intervention session, a different randomized group was assigned to participants. Hence, they were able to engage with a different group of randomized peers in each gaming-intervention session.

Students were informed that there were no penalties in the game; however, failure to answer the questions correctly resulted in failure to move forward in the game or accrue additional points. The design was of such a nature that the game could be replicated for use in other subjects of a similar nature. In this case, students learned the content by collaboratively playing the game. The game was designed for groups of between three and five players on each team during classroom interaction (Titus & Ng'ambi, 2019). The game was also designed to be played by students individually for the purpose of revision or prolonged content engagement. The game could be played on a laptop or a mobile device such as an iPad, tablet, or smartphone. Largely because they also had access to the internet at their higher education institution, the participants in the current study were able to access the game, as demonstrated in Table 1. In addition, the game was implemented every three weeks, after enough content was covered to engage in the next section of the game.

Table 1. Where and how students accessed the internet

Where Students Accessed the Internet (n = 106)	Percentage (%)	How Students Accessed the Internet (n = 106)	Percentage (%)
Home	70.8	Desktop	31.1
Campus	59.4	Laptop	77.4
Internet Café	4.7	Mobile Phone	82.1

Table 1 offers an explanation about internet access in general in order to understand how great the digital divide may be given some of the challenges related to the digital divide and digital inclusion, as often stated in literature. After each gaming interaction, the teams' scores were saved as a built-in feature of the game. The leader's board, or log sheet, was displayed on the game interface.

QUANTITATIVE RESULTS AND DISCUSSION

In this section, the results and discussion of the findings of this mixed-method study are presented, after which a presentation of the game-based learning model is offered.

Of the participants in Phase 1, 67.2% (43/64) were male and 26.6% (17/64) were female (see Table 2). The data reveal a more equitable distribution in Phase 2, with 50% (21/42) of the participants being male and 47.6% (20/42) female. Some participants preferred not to disclose their gender. The majority of the participants in Phase 1 regarded themselves as Coloured, comprising 60.9% (39/64) of the sample, followed by 15.6% (10/64) White and 6.3% (4/64) African participants. In Phase 2, the spread of ethnic distribution was more uniform, with 30.9% (13/42) Coloured participants, 21.4% (9/42) African, and 23.8% (10/42) White participants. The ethnic distribution in both cohorts reveals that out of the Coloured, White, and African cohorts, African, Asian, Indian and Other students accounted for the lowest numbers in the classroom. This is indicative of the disproportionate access to higher education by students from historically disadvantaged populations in South Africa. In addition, the ethno-cultural distribution informs the disparate cross-cultural interactions in the classroom.

The numeric insights into the participants' interaction and engagement preferences following the digital game intervention across Phase 1 and Phase 2 are illustrated in Fig. 2.

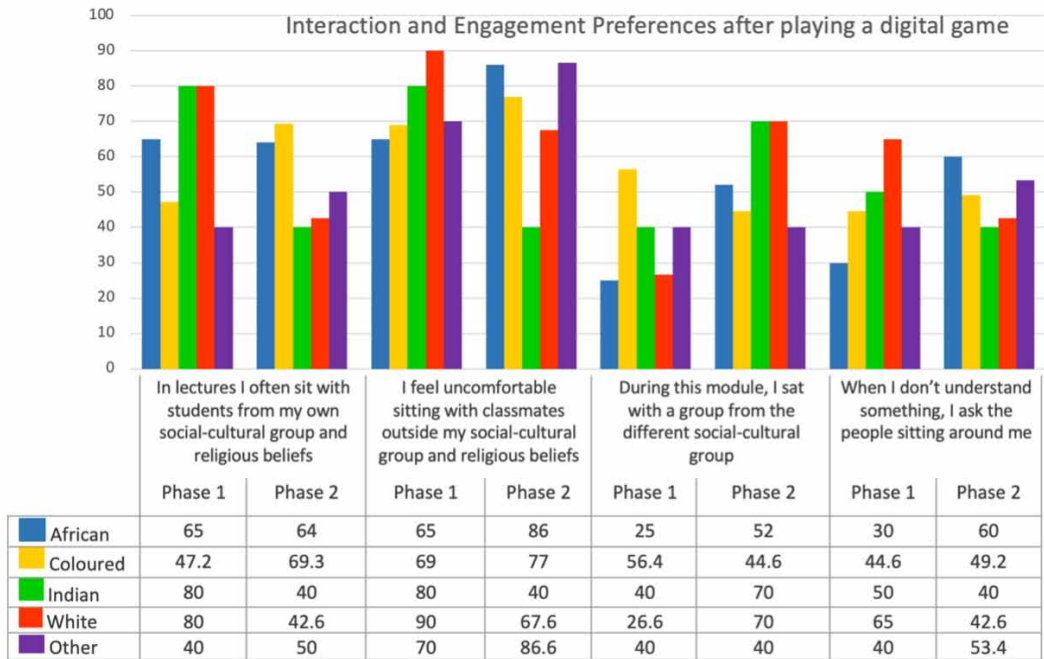
In this study, as a diverse group, 51.3% of the participants from Phase 1 and 41% from Phase 2 disclosed that in lectures, they usually sat with students from their own socio-cultural backgrounds

Table 2. Demographic information

Demographic Variable	Phase 1 (n = 64)		Phase 2 (n = 42)	
	n	%	n	%
Gender				
Male	43	67.2	21	50
Female	17	26.6	20	47.6
Undisclosed	4	6.2	*1	2.4
Year of Study				
First	-	-	1	2.4
Second	60	93.7	38	90.4
Third	1	1.6	1	2.4
Undisclosed	3	4.7	*2	4.8
Degree				
BA	33	51.5	26	61.9
BSc	28	43.8	14	33.3
Undisclosed	3	4.7	*2	4.8
Ethnicity				
African	4	6.3	9	21.4
Asian	-	-	2	4.8
Coloured*	39	60.9	13	30.9
Indian	3	4.7	7	16.7
White	10	15.6	10	23.8
Other	1	1.6	-	-
Undisclosed	7	10.9	*1	2.4

*Note: in South Africa, the term Coloured refers to individuals from a mixed-race ethnicity. Coloured, formerly Cape Coloured, is a person from mixed (White and African) or Asian descent, as officially defined by the South African government from 1950 to 1991.

Figure 2. Interaction and engagement preferences following digital game intervention. The higher the percentage, the stronger the disagreement with the statement.

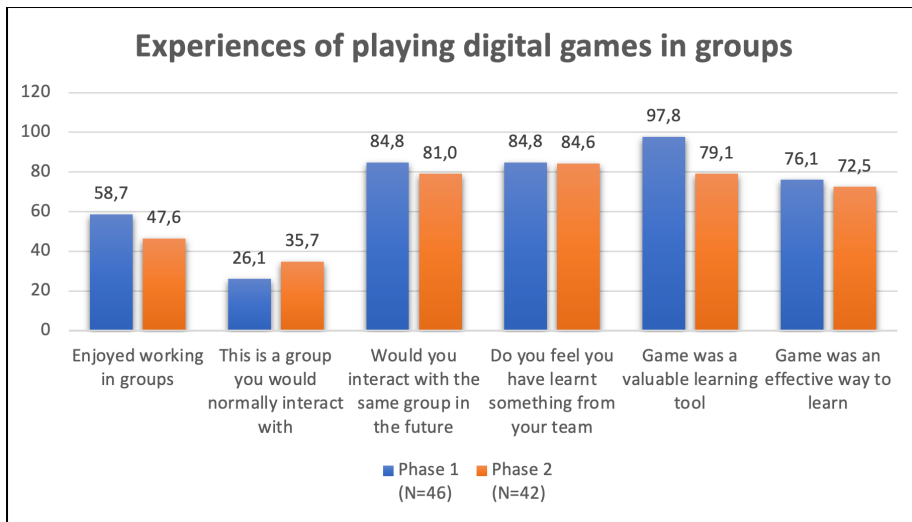


and religious beliefs. More notably, as illustrated in Figure 2, there are marked differences in the responses based on the ethnicity/socio-cultural background of the participants. African, Indian, and White participants in Phase 1 stated that they did not often sit with peers from their own socio-cultural groups, and the Coloured participants were in agreement. In Phase 2, African and Coloured students concurred that they did not sit with their socio-cultural grouping; however, White, Indian, and other denominations confirmed their seating preferences as more homogeneous. During this intervention, more participants, as a group from Phase 1 (55%) and Phase 2 (48.7%), reported that they had sat among students from different socio-cultural backgrounds, suggesting that the methodological approach to randomization was effective.

Regarding ethnicity, African, White, Indian, and other students concurred that during this intervention they sat with different cultural groups. Coloured participants were the only students to disagree, which could be related to the fact that they comprised 60.9% of the participants in Phase 1. In this study, the strength of the randomization technique in a gaming intervention suggests that the routinization of everyday interactions, as highlighted by Giddens (1984), developed the ontological security (trust) in the participants required for meaningful social interaction. The participants also revealed that when they did not understand the module content, they were comfortable enough to ask their peers sitting close to them. Therefore, if they were sitting in their cultural groups, the knowledge would only have been generated in those groups, which may have negative consequences for the construction of knowledge, as anything learned would be contained within cultural-cluster groups and not shared across groups in the classroom.

In Figure 3, the frequencies related to the randomization playing in groups are depicted. The results revealed that 58.7% (27/46) of the participants from Phase 1 enjoyed playing games in groups, while fewer participants, 47.6% (20/42), experienced the same in Phase 2. Following the randomization of teams, both cohorts indicated that none of the groups to which they were assigned was a group they normally would engage with in educational activities. Therefore, only 26.1% (12/46) of the

Figure 3. Frequencies of experiences playing games in randomized groups



participants in Phase 1 and 35.7% (15/42) from Phase 2 routinely interacted with the random group members on previous occasions. This was quite low for students who had been in a sport-studies program for one-and-a-half years, indicating a lack of cross-cultural interaction in the class, with students recursively aligning themselves with the same largely homogeneous groups.

However, following the intervention, the majority of the participants, 84.8% (39/46) from Phase 1 and 81% (34/42) from Phase 2, expressed that they would interact with the same group in the future, demonstrating that the use of digital games facilitated cross-cultural interaction. The results possibly indicate a production of new structures of legitimation, signification, and domination as the reformation of social practices in which multicultural groups are the facilitator, as well as the consequence of the participants' conduct. The crux of this study is linked to the production and reproduction of cross-cultural interactions, and the results revealed that new structures had been produced, which may be the result of the implementation of a digital game. Most of the participants from Phase 1 (84.8%) and Phase 2 (84.6%) positively indicated that they had learned from their new team members. Additionally, there was a strong indication that the participants in the current study perceived the digital game as a valuable learning tool. Therefore, cross-cultural construction of knowledge was evident, as the students admitted to having learned something from their new team members while playing the digital game. Besides, 76.1% of the participants from the cohort in Phase 1 and 72.5% from the cohort in Phase 2 indicated that the digital game was an effective way to learn; therefore, a new perception of learning was produced. Tucker asserts that, through reflexive monitoring, people rationalize their social conduct (Tucker 1998), which accounts for their behavior (in this case, cultural clustering), and draw on shared cultural stocks of knowledge that are used in the reproduction of their actions.

A repeated-measures ANOVA was applied using the pre- and post-questionnaire average scores as the dependent variable and examining the differences between the cohorts in this study, between the pre- and post-intervention time points of the same cohort, and between the pre-intervention time points across cohorts. This score comprised the mean of 13 questions asked in all questionnaires.

Table 3 indicates that participants from Phase 1 expressed slightly higher engagement scores before and after the digital game intervention compared to those of their counterparts in Phase 2. It also shows that the level of engagement score decreased from the pre- to the post- time point. Due to the scoring of the instrument, lower numbers mean a higher level of agreement. However, there was an increase in engagement levels before and after the interventions for the participants in both phases,

Table 3. Mean scores for levels of engagement for Phase 1 and Phase 2

Time	Phase 1		Phase 2	
	Mean	95% CI	Mean	95% CI
Pre-module	2.34	2.18–2.49	2.49	2.30–2.67
Post-module	2.28	2.13–2.44	2.43	2.24–2.61

but this was not significant. This suggests that the use of the digital game may have positively affected engagement. Given that the participants were randomized, it can be inferred that the implementation of a digital game improved cross-cultural engagement. The results of the repeated-measures ANOVA are shown in Table 4.

Table 4 indicates that there was no significant difference between the Phase 1 and Phase 2 cohorts [$F(1, 62) = 2.054, p = 0.157$] in their levels of engagement. Additionally, levels of engagement did not significantly change over the course of the module [$F(1, 62) = 0.006, p = 0.940$], even after introducing a digital game, a wiki, and a blog. Similarly, the change from pre- to post-intervention was of the same magnitude [$F(1,62) = 0.766, p = 0.385$] in Phase 1 and Phase 2. This means that the introduction of a digital game, a wiki, and a blog did not have an effect on classroom engagement. While cross-cultural engagement was not measured on this scale, this finding should be viewed in light of the qualitative findings, which suggest otherwise, as it does not fully answer the research question of how the implementation of a digital game fosters cross-cultural engagement and interaction in the classroom. However, given the importance of student engagement for student success, this finding is of importance for pedagogical application of digital games, wikis, and blogs in the classroom. The findings suggest that there is no significant difference in levels of engagement of those who participated in this study. The reason for the lack of significant changes in scores may be self-reporting bias on the part of the participant. There may also have been a learning effect while completing the questionnaire.

QUALITATIVE RESULTS AND DISCUSSION

The qualitative findings below describe how the implementation of a digital game revealed the mental structures that hindered cross-cultural interaction in the classroom. The social actions, linked to cross-cultural engagement, are explored in the themes that emerged. These themes include development of cliques, cross-cultural engagement, and playing in random groups. The observation of students enrolled in the sport-studies program revealed their selectivity regarding the location of seating in the classroom, although this may be perceived as an activity that reinforces agency, as their seating choices are made independently. The findings revealed that cliques contributed to their seating preferences in this particular module. Pseudonyms were not used; instead a unique code was attached to the narratives of the participants below.

Table 4. Repeated measures scores between cohorts pre- and post-intervention

Effect	<i>F</i> Statistic (df)	<i>p</i> -Value
Difference between cohorts	2.054 (1, 62)	0.157
Change from pre- to post-	0.766 (1, 62)	0.385
Difference in change between cohorts	0.006 (1, 62)	0.940

Development of Cliques

When the nature and composition of groups in the classroom were explored in terms of with whom the participants in the current study interacted, it was clear that modest interaction and engagement occurred between various cliques. The following extracts refer:

I think the nature of our class is that, in a few of our classes, people stick to the same group, and it co-incidentally happens to be but it's not...people haven't intentionally done it but subconsciously you end up with the same people. [BP 2: T1- 2:14]

I stick to the same people, because you know it's predictable, you know what to expect, in terms of people you work with, you know their strengths and their weaknesses. [BP 2: T1- 2:16]

Invariably, the participants in this study revealed that the intention was not to create isolated groups/cliques. They regarded it as unintentional acts and were aware that it could hinder their progress. Underpinned by the duality of structure, as demonstrated by Giddens (1984), specific legitimation suggests that the participants had some preconceived ideas of existing social practices in the classroom activities. They had created a norm for the behavior of their class. Apparently, a social phenomenon that influences social interactions exists, as indicated by some comments from the participants. Consequently, the unconscious and unacknowledged conditions that influence social actions in the classroom have had unintended consequences for social interaction and, therefore, cross-cultural interaction. While the participants were knowledgeable beings, they were acting out, hence producing and reproducing social practices that held potentially negative implications for cross-cultural engagement. The mental traces of a historically segregated system were still embedded in the subconscious of students at the higher education institution under study, as there was clear evidence of cultural clustering. As knowledgeable agents, the students acted out social practices that had negative implications for cross-cultural engagement by unintentionally producing cultural cliques.

Similarly, Jones and Karsten (2003) assert that knowledgeable agents' actions are bound by unconscious and unacknowledged conditions that result in unintended consequences of said actions. The contradictory affirmations by the participants indicate that while students do not intentionally create homogeneous groups, they draw off selective processes linked to the attributes of their peers. This complexity in the social interactions has serious implications for cross-cultural engagement. Should this line of reasoning continue, and should the conditions of the classroom not be disrupted, cross-cultural interactions would be hindered as an unintended consequence of social actions.

Cross-Cultural Engagement

The diverse nature of classrooms in South African higher education should provide a rich environment for collaborative construction of knowledge. When probed about interacting with peers from different social backgrounds in the classroom while playing the game, the participants were affronted about the concept of cross-cultural interaction. Their responses below highlight their frustration regarding socio-cultural conversations:

This culture thing is being dragged...we're still going to be talking about "How do you feel about culture?" It's not important anymore...I can't deal with this conversation anymore...I just sit next to whoever happens to be there and whoever I want to talk to. [AP 2: T2- 2:16]

You don't want to be forced to work with people that you don't want to work with. All this cultural differences, whatever! You're like almost 20 and you haven't been exposed, especially if they're sport students, you're bound to meet people from different social backgrounds. [AP 2: T2- 2:33]

From the above responses, an acknowledgement of the differences does exist and the classroom does perpetuate them because of the limited time to learn from each other and about each other. Consequently, the participants' levels of frustration in this regard highlight the complexity of their opinions on the issue of cross-cultural engagement. As knowledgeable agents, the contrasting views about the importance of culture, and the fact that they are able to describe culture, reveal the reflexive nature of the participants in this study, as well as their ability to monitor their experiences in order to provide reasons for their actions. Therefore, it appears that they possess agency in the form of discursive consciousness.

While there was a distinct perception of resentment regarding the topic of culture but not the interaction with culture itself, the participants in this study revealed on further inquiry that playing the game in random social groups created cultural awareness. Consequently, the introduction of digital games reshaped social norms in the classroom, as highlighted in the following extracts:

Like the times when you sit with someone who is Xhosa...you are a Coloured...you try to learn some aspects of the Xhosa culture, and they in turn try to learn about the Coloured way of doing things... peers across the cultural barriers... I think the games allows you to talk to each other about things like that. [BP 2: T1- 2:20]

My take is that it helps, because guys have different mentalities and different groups have different mentalities, so it helps you to understand others. [BP 3: T3- 3:6]

I was just going to say, like, I think that maybe working with different cultural backgrounds...language barrier is also a factor as well. [AP 2: T2- 2:34]

Language is a crucial medium through which people address social problems together. The above responses indicate that structures of signification are apparent, as language is an enabling as well as constraining factor for cross-cultural interaction. While, on the one hand, there is evidence of an attempt to "learn some aspects of the Xhosa¹ culture," the findings indicate that engaging with the digital game invoked agency, as the participants were taking responsibility to learn about their peers' culture, thereby enabling cross-cultural interaction. The Council for Higher Education (CHE, 2010, p. 40) purports that culture is "historical and specific" and reflects the way in which social groups are organized in society. Therefore, this implies that academia needs to make better use of opportunities that provide for rich interaction in a diverse cultural setting. If the academic project is unable to achieve this, it would be a missed opportunity to exploit the richness of diversity and to mediate engagement in a diverse classroom setting.

Additionally, the findings reveal that the clustering of students into groups hinders cross-cultural interaction, as well as the collaborative construction of knowledge across cultural groups in the classroom. Giddens (1984) ties the unconscious to what he refers to as memory/mental traces. While cultural clustering may be unintentional, it was clear that the students, autonomously, entered into a position of their own volition and possessed the agency to adapt as well as transform the rules by which these decisions are made, thereby activating structures of legitimation. Rules are not abstract and are only constituted through action (Tucker, 1998; Giddens, 1984). These conditions were created because of mental/memory traces that transformed their situation of their own volition, thereby recursively reproducing dominant social norms. Giddens (1984) asserts that social conventions are important to producing social life. Therefore, in line with this reasoning, the conditions that inform the social activities in the classroom may seem simple to students; however, they are extremely complex and require a certain amount of culturally specific knowledge (Giddens, 1984).

Ravjee et al. (2010) report on the cultural policies of equitable access, where the complexity of social relationships is highlighted. Students interacted with peers from different socio-cultural backgrounds during the current study, which highlights the strength of the social-constructivist

approach in relation to learning through active engagement and meaningful activity, as highlighted by Wilson (2011). This notion is echoed in the observed findings of the current study, which revealed that students preferred to sit with peers from their own socio-cultural background. According to the authors, however, because of a gamified space, the participants were willing to shift their socio-cultural preferences in the learning environment, thereby transforming structures of signification (their understanding of roles in the classroom), domination (how they draw on and elicit resources to exercise power), and legitimation (appropriate behavior/interaction). For both cohorts in the current study, the social-constructivist learning environment created a meaningful space to uncover practices of cross-cultural interaction and engagement, bearing in mind that the majority of participants did not interact with a different group prior to this study.

Playing in Random Groups

The participants in the current study reported that when they played the game in random groups, it helped them to gain confidence, as disclosed in the following extracts:

I started gaining more confidence, and I remember with the one group that I was sitting with there were about four or five and I could give some of the answers... it's definitely affecting my performance as well... [BP 2: T1- 2:19]

Obviously, it does allow for interaction because it's a group assignment. The game possibly can get people together as well, because, I mean, once you start getting answers out, you're more confident... [AP 2: T2- 2:26]

The above narratives indicate that the randomization of groups allowed for interaction and a realization that they were better able to relate to their peers. Over time, the socialization aspect in the interaction allowed them to develop a sense of confidence, which affected their performance. One participant indicated that engaging in the digital game with her peers allowed her to develop a sense of confidence, which she had not experienced previously. Therefore, confidence offers structures (domination) that may impede social engagement if it is not possessed by the participant or promote it if an artifact, such as a digital game, is used.

While the participants claimed to have enjoyed the interaction and that it developed their confidence, a serious-mindedness accompanied the group dynamics, indicating that there was an adaptation of resources in an interaction space, as per the following extracts:

I think it's actually better if you get randomly selected, because if you are going to get into a clique, and what are the chances that you are going to talk about work, you know what I mean, because you have something in common with all your friends, like, you're not going to really speak about work. That's what I think, because, like, the work gets second priority at times. [AP 2: T2- 2:10]

You wanted to work, because when you're with friends you tend to snap off a bit and just make fun and stuff all the time. But when you're with other people, you actually want to work then; you want to work, like, not hinder. [AP 7: T1- 7:12]

The participants in the current study reported that the implementation of the game in random groups allowed for a better work ethic, as opposed to engaging in the game with their usual clique. The social phenomenon of cliques reveals that there was a reproduction of actions in the existing system; however, the use of the digital game allowed for the adaptation of these actions. Interactions with the digital game indicate that productivity levels increased because of randomization. The work ethic of students, therefore, improved in a gaming activity with random peers. Consequently, the use

of games as the material resources as well as the attributes of groups and relationships with new people created new structures akin to cross-cultural interaction.

However, according to the authors, interaction and socialization are not guaranteed through innovative intervention, as the dynamics of group work influences interactions. Baab (2012) highlights that group composition presented challenges related to individual levels of contribution, grading, project management, and the way groups are assembled. Groups form an integral part of society (Carabajal et al., 2003). Giddens (2009) indicates that it is common for one ethnic group to occupy power over another, in which case group closure, such as cultural clustering, coincides with resource allocation. This is indicative of how allocated resources in the duality of structure reproduces structures of domination.

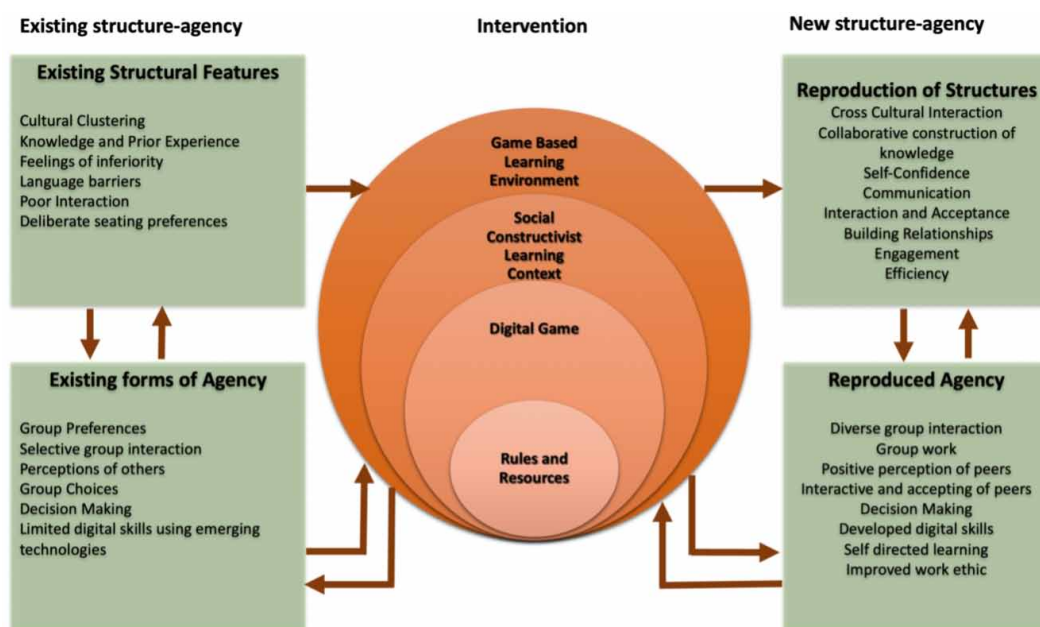
Therefore, based on the above findings, it is evident that the structures that underpin the interactions of cross-cultural group work are flexible. The former/outgoing structure represented one that was fraught with a lack of interaction across cultural groups, as well as with classmates, inside or outside of the classroom.

MODEL OF SOCIAL-CONSTRUCTIVIST GAME-BASED LEARNING

The proposed theoretical model below attempts to provide an exemplar that may provide the sport science, as well as other health-science academia, with a deeper understanding of a game-based learning environment, which may facilitate the production and reproduction of cross-cultural interaction. In addition, the model offers a systematic way of disrupting social structures that recursively inhibit cross-cultural interaction to form the desired social structure.

A context-specific, social-constructivist, digital game-based learning model for cross-cultural interaction is recommended as an instrument to facilitate cross-cultural pedagogy in sport studies (see Fig. 4). Figure 4 depicts the essence of the current study regarding the role of a game-based learning environment in which student agents focus on engaging with a digital game and play in a social-constructivist learning context. The use of a digital game as an intervention allows for reflexivity, as

Figure 4. A social-constructivist, digital game-based learning model



knowledgeable agents learn from their actions and adjust their subsequent actions, which ultimately informs their social interaction with peers. Consequently, the use of a digital game uncovered the mental structures and enabled the production and reproduction of cross-cultural interaction.

This model is useful to:

- Depict how cross-cultural interactions are produced and reproduced.
- Explain how rules and resources inform social behavior.
- Describe how agency is identified and explained in a social learning context.
- Explain how agency informs social actions of cross-cultural interaction.

This model is viewed through three interrelated components that consider the following: 1) pre-existing patterns/structures as students enter the classroom; 2) the game-based learning environment; and 3) the production and reproduction of structures.

As depicted in Figure 4, the first component, existing structure-agency, referring to the boxes on the left, considers the interplay between the existing structural features and the existing forms of agency that impact cross-cultural interaction. For instance, the model considers how cultural clustering may be reproduced to foster cross-cultural interaction. These structural features are informed by existing social practices. Over time, students, as knowledgeable agents, are able to monitor their experiences reflexively, which also informs their social actions. These existing forms of agency, therefore, allow for the formation and reformation of social action, which create structures that organize their social action and, subsequently, implicate the production and reproduction of cross-cultural interaction.

The second component, depicted in the center as a Venn diagram, illustrates the game-based learning environment. This includes the following elements:

- **A game-based learning environment:** The game-based learning environment nests the social-constructivist learning context. The digital game comprises rules and resources that inform cross-cultural interaction and are found in the game-based learning environment.
- **Social-constructivist learning context:** This context rests in the game-based learning environment. It is important to understand the context-specific matters that may inform interactions in the classroom. Given that students enter the classroom with prior knowledge, experiences, and ideas, this learning context allows for collaborative construction of knowledge. Vygotsky's (1978) research suggests that learning is a social activity. Therefore, within the social constructivist space, the use of emerging technologies provides a platform for learning tasks to be considered where students work collaboratively in an authentic learning space.
- **Digital game:** The digital game resides within the social-constructivist learning context. In this instance, a quiz game was played among random groups. By playing the game in random groups, the students were able to become familiar and socialize with peers in their class. Therefore, randomization was critical to facilitate cultural interaction. In the current study, the digital game was based on a quiz game that related to the prescribed course reader. In this way, the students could learn course content using a digital game and therefore consolidate their learning about various concepts.
- **Rules and resources:** Rules and resources form part of any game, including digital games. One of the main features, embedded in the rules, is that of the randomization of the entire diverse class. Therefore, in keeping with the rules of being in a randomized group, the students draw on their organizational capacities, also seen as resources, to allow them to play the digital game as a diverse, randomized group. Randomization allows for communication between diverse groups while playing the game and thereby the potential to reproduce structures of signification by way of example. Without randomization as a rule for cross-cultural interaction, it may implicate the social power present within groups and result in disproportionate cross-cultural interaction. Material resources in this model also consider the emerging technology tools, which served as a medium for cross-cultural interaction to take place.

The third and final component of this model, new structure-agency, illustrates the production and reproduction of structures because of the provision of a game-based learning environment. As can be seen from the model, a game-based learning environment positively informs cross-cultural interaction because new structures are produced, as evidenced through the students' actions. However, social action can only be understood within the context of cross-cultural interaction and is usually in the form of unarticulated beliefs that students use to interpret their own actions as well as the actions of their peers. Therefore, the reproduction and production of agency inform how cross-cultural interaction is manifested in the classroom.

The above model reveals that pre-existing structures affect actions manifested in the classroom. This model was also informed by a process of structuration. Similar to Giddens's (1984) duality of structure, interactions inform the structures that human agents employ to produce, reproduce, and shape their social realities. This model is specific to the sport-studies learning context; however, it could be applied to other learning contexts.

IMPLICATIONS FOR PRACTICE AND FUTURE RESEARCH

The impetus for this study arose from the need to address the lack of cross-cultural engagement in the classroom. This study critically explored the production and reproduction of cross-cultural interactions using game-based learning in sport studies in South Africa. The practical contribution that this study offers is that academics should carefully consider the use of digital games in the classroom; they should be purposefully selected based on their affordances in multicultural settings. In addition, the randomization of students in a class is beneficial as it allows for a deepened experience of cross-cultural interaction with students from diverse cultural backgrounds. It is recommended that further research could be conducted on the use of digital games for cross-cultural learning and social justice where such an intervention could be used to offer insight into or address social issues as a form of gamified activism. Such research may offer insight into how the notions of different cultures could be reshaped and reproduced by using digital games in multicultural classroom settings.

CONCLUSION

The paper has reported on the potential of digital games to interrupt social practices that are unconsciously produced and reproduced and has shown how student engagement and meaningful learning can be realized using game-based learning. The adoption of a social-constructivist game-based learning environment is recommended as an innovative approach to teaching and learning because it positively changes classroom behavior toward learning. The implementation of a game-based learning model may allow for wider interaction in random, cosmopolitan groups. Careful design of the digital games and other online learning tasks for the facilitation of cross-cultural student engagement may have an impact on the delivery of a blended learning course.

The paper has presented evidence that emerging technologies could foster conditions that allow for the production and reproduction of cross-cultural interactions. The participants in the reported study had positive experiences while using digital games in the classroom. Therefore, it could be concluded that the structures of signification, domination, and legitimation, from the interaction level to the structure level, were produced and reproduced because of digital games. Consequently, the process of cross-cultural student interaction that had been repeated throughout each participant's academic career was reshaped and reproduced by using digital games tools that affected the interactions in the classroom.

The paper concludes that when participants engage in a cross-cultural game-based learning environment, the social practices acquired through their academic career could be interrupted,

reshaped, and reproduced into new practices. Finally, a social-constructivist game-based learning model to foster interaction within multicultural higher education classrooms has implications for educators, students, researchers, and policy makers.

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AUTHOR NOTE

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ENDNOTE

¹ Xhosa is one of the 11 official languages in South Africa.

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