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# To Game or Not to Game? How Using Massively Multiplayer Online Games Helped Motivation and Performance in a College Writing Course: A Mixed Methods Study

## **About the Author(s)**

Papia Bawa is an English Professor and Instructional designer, with more than 14 years of experience in academia. She has worked at institutions like Purdue University and Ivy Tech Community College. Her research focuses on learner-centered learning environments, cultural inclusivity issues in online and offline courses, and technology centered curriculum, including game based learning. She has extensive experience in writing and publishing scholarly articles, poetry and creative non-fiction. She serves on the Editorial Board of Atrium, Ivy Tech Community College's refereed journal, as well as a reviewer for several scholarly journals such as Journal of Economics and Finance Education (JEFE), Curriculum and Instruction, Journal for Research Initiatives, American Educational Research Association (AERA), Educational Researcher, and Association for Educational Communications and Technology (AECT).

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## **Keywords**

Game Based Learning, performance outcomes, cognition, digital games, engagement, online, massively multiplayer online games

## TO GAME OR NOT TO GAME? HOW USING MASSIVELY MULTIPLAYER ONLINE GAMES HELPED MOTIVATION AND PERFORMANCE IN A COLLEGE WRITING COURSE: A MIXED METHODS STUDY

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### Abstract

The use of Massively Multiplayer Online Games or MMOGs is receiving attention in the educational world due to increased availability of such games, a growing consumer base, and the proven benefits of video games as engagement tools. MMOGs that have been known to possess a significantly high capacity to keep users involved over sustained periods, which gives them the potential to enhance learning experiences and performances. However, most available studies on MMOGs do not discuss relationships between MMOG use and performance outcomes in Higher Education. Additionally, majority of such studies focus on examining a single MMOG, providing limited scopes of understanding the benefits of multiple MMOGs as educational tools. Using a sample of 32 students, this mixed-methods study investigates and supports how inserting MMOGs within an undergraduate Online English Composition section helped improve learners' performance and engagement. Practitioner and future research implications are also discussed.

### Introduction

In 2015, one hundred and fifty-five million Americans played video games, with at least two players in each game-playing household (ESA, 2016). On an average, video gamers have 5 weekly game sessions, lasting approximately 1.9 hours per session. Of these games, Massive Multiplayer Online Games or MMOGs are the most played (SuperData Research, 2016). Given the rising popularity of these games, it is not surprising that using MMOGs as part of Digital Game Based Learning (DGBL) is becoming increasingly feasible due to the variety and availability of such games, as well as their increased consumption by gamers worldwide (Gros 2007; Hainey, Connolly, Stansfield, & Boyle, 2011; Pivec 2007). Several studies as well as conceptual literature indicate that video or digital games in general have great entertainment, engagement and educational benefits (Bogost, 2007; Griffiths, 2002; Paraskeva, Mysirlaki & Papagianni, 2010; Zarraonandia, Diaz, Aedo & Ruiz, 2014).

Video games, including MMOGs, can provide learning challenges in highly interactive ways (Hung, Kinzer & Chen, 2009; Kiili, 2010; Marvel, 2012; Paraskeva, Mysirlaki & Papagianni, 2010; Romero, 2016; Tsai, 2016; Van Eck & Hung 2010), and allow learners to learn through virtualization and socialization (Szell & Thurner, 2010). Analysts predict the growth of MMOG market due to this high level of interest and emotional connections users have (Suárez, Thio & Singh, 2013). Additionally, the immersive environments of MMOGs aid in the development of learning skills such as communication, evaluation of information, research, problem solving, and literacy, as well as provide players with scaffolds for technological and content knowledge (Schrader & McCreery, 2008). This suggests that MMOGs may be ideal for DGBL strategies as they can be powerful engagement tools within learning environments.

Existing research on MMOGs include games like World of Warcraft and Everquest, being used for language learning and writing (Colby & Colby, 2008; Heathcote, 2012; Kongmee,



Strachan, Montgomery & Pickard, 2011; Lee & Pass, 2014), ethnography and anthropology (Delwiche, 2006; Nardi, 2009; Servais, 2015), human behavior and psychology (Longman, O'Connor, & Obst, 2009), adult social interaction (Zhang & Kaufman, 2015), teacher perceptions (Schrader, Zheng, & Young, 2006), and guild and communal life within the games (Williams, 2006). This trend in the current literature to study single MMOGs at one time may leave a significant gap in our understanding of the value of MMOGs as a game genre. Ryan, Rigby, and Przybylski (2006) discuss how limiting the investigations to single games when studying the co-relation between MMOGs and performance/engagement is not desirable. Given the vast array of MMOGs available, it is possible that attempts of extrapolation may be limited by the lack of knowledge of the aspects of the games that give them their true value versus estimated assumptions of their value. Thus, for this study an attempt was made to steer away from the popular games such as WoW and Everquest, and use instead some free-to-play MMOGs that have not been used in scholarly studies so far. Thus, four MMOGs called Skyforge, Age of Conan, Rift and Tera Rising, were the ideal selections. Even though MMOGs are emerging as interesting, viable options for instruction, their usage in Higher Education is limited (Godwin-James, 2014; Law & Sun, 2012; Yuzer & Kurubacak, 2014), and there are not many studies on the effects of DGBL on performance outcomes (Perrotta, Featherstone, Aston & Houghton, 2013). Thus, there is a need for research, which investigates the value of DGBL approaches in the context of engagement and performance in Higher Education (Epper, Derryberry, & Jackson, 2012). This may be particularly useful for community college learning environments where there is precedence of issues with faculty and student engagement negatively affecting performance outcomes (Bolliger & Wasilik, 2009; Bonk, 2001; Jacoby, 2006; Maguire, 2005).

This mixed methods study examined the effects of using free-to-play Massively Multiplayer Online Games (MMOGs) in an online English Composition course in a community college. To get a comprehensive view of this effect, it should be viewed through multiple lenses such as learners' perceptions with regards to engaging/interacting with MMOGs, and their overall performance in the course. The selection of MMOGs as an educational resource for study was based on the perceived value of such resources as discussed in the following paragraphs. In order to fully understand the phenomenon of learners' interaction with MMOGs, it was important to investigate their perceptions with respect to such interactions, as well as their performance as a result of such interactions. Thus, the study sought answers to the following questions:

1. What effect does exposure to instructional activities involving Massively Multiplayer Online Games (MMOGs) have on learners' performance outcomes versus non-video-game based learning environments?
2. What are learners' perceptions of their experience of interacting with MMOGs as part of their coursework?

For the purposes of this study, DGBL is seen as the process whereby digital games are included as part of a curriculum and used for different educational purposes like instruction and assessments (Nadolny & Halabi, 2015; Prensky, 2001; Van Eck, 2015). DGBL environments encourage learners to do a variety of things that may include active game-playing or exploring various aspects of the game to satisfy the learning contexts created by the course designer or instructor, and engaging in problem solving activities (Delwiche, 2006; Killi, 2005; Nadolny & Halabi, 2015; Pivec, 2007; Pivec, Oziabenko & Schinnerl-Beikircher, 2014; Tsai & Fan, 2013).

## Methodology

### Mixed-Methods

A mixed-method approach (Creswell, 2014; Creswell & Plano-Clark, 2007; Halkier, 2011; Johnson & Onwuegbuzie, 2004; Schröder, 2012) was found to be appropriate for this study's purpose, given the foci of the research questions on performance and engagement in the context of MMOG based curriculum. While performance outcomes may be utilized as an argument to favor or disfavor the use of MMOGs, the argument can be significantly more compelling when married to how the end users/learners perceived their experiences with such learning environments. Having this information may allow future researchers to have a better understanding of what to include and what to avoid when designing or researching DGBL using MMOGs. Creswell and Plano-Clark (2007) define mixed methods as one whose central premise involves the use of quantitative and qualitative methods to provide a better understanding of research problems than either approach alone. Equal weight was given to the qualitative and quantitative phases in terms of time spend to collect data, variety of instruments, and rigor of analysis. The integration was achieved both in the data gathering and discussion of findings. After analyzing the qualitative and quantitative findings separately, a synthesis of both was done as shown in Table 3.

True experimental methodology (Johnson & Christensen, 2014; Berry & Yost, 2013) for quantitative and Phenomenology methodology (Creswell, 2014; Husserl, 1931; Patton, 2015; Percy, Kostere & Kostere, 2015) for qualitative data were used. Using Creswell's (2014) convergent-parallel mixed-method approach, both qualitative and quantitative data was collected at roughly the same time and then converged "in order to provide a comprehensive analysis of the research problem" (Creswell, 2014, p.44). The three key identifiers of True Experimental design are randomization, control and manipulation (Johnson & Christensen, 2014; Berry & Yost, 2013), which the study incorporated. The class sections were selected randomly and the duration of usage and type of game were controlled. Participants were randomly placed in experimental and control groups, where the former given instruction through an MMOG- fused-curriculum, while the latter were given lecture- based- only instruction.

Phenomenology focuses on gaining an understanding of social, cultural and psychological phenomena from the perspectives of the people involved, including careful and thorough data gathering on how people perceive something, describe it, feel about it, judge it, remember it, and have conversations about it with others (Creswell, 2014; Husserl, 1931; Patton, 2015; Percy, Kostere & Kostere, 2015). The study's intent mirrors this in that it examines participants' interactions with and reactions to MMOG based learning environments. Following a Hermeneutic approach to frame the research design, the findings emanated from the researchers' interpretation of the participants' stories about their relations to and perceptions of the world around them in the context of the study's focus. Even though there are no fixed set of rules for a Hermeneutic approach, several suggested techniques such as rigorous reading, reflecting and interpreting text for codifying for creating a hybrid text to provide justice to the life world stories of the participants, were used (Ajjawi & Higgs, 2007; Kafle, 2013; Langdrige, 2007; Sloan & Bowe, 2014; van Manen, 2007).

### Setting and Participants

Participants were selected from one Midwestern Community College Campus with an approximate population of 5100. The sample population were 32 students from two Introductory Composition courses in an Associate's Degree program. Participants were mixed in terms of

ethnicity, with little to no gaming background. Students were knowledgeable in computer usage, as they were enrolled in online courses.

### **MMOG Selections**

The first selection criteria for selecting games was that they have a free- to- play option, due to lack of budgeting for games from the institution. After examining approximately fifteen MMOGs from the top 2016 list, four MMOGs (Skyforge, Terra Rising, Rift and Age of Conan) were selected for the study, based on their ease of use as determined by four gamers including the researcher, as well as the relevance of the game contents to the writing tasks. The richness of lore, settings, character descriptions, graphics, and associated text materials were suitable as topics to write Summary and Response as well as Rhetorical analysis essays. Such essays involve summarizing and responding to the texts, and commenting on the writing and content style such as language, graphics, organization style used (Ramage, Bean, & Johnson, 2014).

Instead of focusing on one specific MMOG, students were given four options to choose from. This was appropriate for several reasons. First, the study examined the potential of MMOGs game genre as providing viable tools for learning. Thus, using a single MMOG would be unsuitable for the study's focus. Second, it was anticipated that students would have different backgrounds, perceptions and values pertaining to their learning and the DGBL process. Thus, having a choice would allow greater motivation to participate, as the attractiveness of choice could be correlated with related values (Polanía, Moisa, Opitz, Grueschow & Ruff, 2015; Verplanken & Holland, 2002). In selecting 4 MMOGs, the idea was not to restrict the investigation of the co- relation between MMOGs and performance/engagement to a single game's content, as that could limit the scope of understandings, as the researchers examined the feasibility of MMOGs as a game type that can be easily and conveniently used as educational tools.

### **Data Sources and Methods**

Upon receiving IRB approval from the college, 32 participants, 16 from each of two Introductory Composition sections, were used. One section was used as the experimental (EEM) and one as the control (CEM) group. Even though the sample size is relatively small, it is adequate to test intervention efficacy in a between- group investigation. Following the suggestions made by Johnson and Christensen (2014), random, but representative-cluster sampling was used and the response rate was calculated at 82% (actual participants  $n=32$ /total sample based on students enrolled in first week of class in selected sections  $=39 \times 100=82\%$ ). According to Johnson and Christensen (2014), for a sample to be representative of a population, the acceptable response rates should be approximately 70% and higher. Additionally, using the numbers in Table 10.5 provided by Johnson and Christensen (2014) denoting recommended sample sizes of various populations with a confidence level of 95,  $n=32$  is considered an adequate sample size for  $N =35$  to 39 (p.267).

Both EEM and CEM groups received the same instructions and assignments, since the courses were part of the institution's statewide standardized packages. However, instructors do have autonomy to select a set of 'core readings' pertaining to a specific topic that students would be required to use to write the assigned essays. For this study, the topic of Digital Game Based Learning was assigned for both EEM and CEM groups. The experimental group participants were given MMOG website based core readings. They were required to select one or more MMOGs from the 4 assigned, and interact with the games through browsing game contents, and/or playing the games. Contents included the textual and descriptive areas within the game sites such as the About, News, Support, Media, and Community sections. These areas included

information on the games' lore, settings, game play directions, and blogs. The experimental group participants were also provided four scholarly articles about digital game based learning as optional readings.

The control group participants were assigned the exact same essays assignments, but instead of the MMOG related contents, they were assigned the same four scholarly articles that were provided as optional readings for the experimental group. The control group were not required to interact with any game content in any way for the purposes of writing their essays. Essentially, both groups had same essays to write, with the only difference being the inclusion or exclusion of game related contents as assigned readings. Both groups were given same time frames for completing the readings. This ensured that the data generated would be more relevant and representative of the intervention effects (Balzer & Sulsky, 1992) as the only difference between the two group's assignments was the inclusion of MMOG based readings for the experimental group.

### **Instruments and Essay Writing Requirements**

For answering RQ#1 (performance outcomes), grades of two essay submissions (Summary & Response Essay and Rhetorical Analysis Essay) from both groups were used. For answering RQ#2 (perceptions about MMOG use in course), discussion forum entries and essay excerpts from the experimental group (introduction forum and week 4 discussion) pertaining to MMOG were used. This was because, even though both groups participated in the same discussion activities, the control group did not discuss any MMOGs as that as not part of their curriculum.

For the Summary and Analysis Essay, the focus was on writing an accurate summary of assigned readings that captured both overall meaning and significant details/sub-points, as well as a well-developed response to the reading that supported the thesis/main claim. Note that in this context, for the experimental group, 'assigned reading' refers to the game contents, while for the control group it refers to the four scholarly articles. For the Rhetorical Analysis Essay, the focus was on commenting upon the different rhetorical aspects of the assigned readings. These included commenting on the visual rhetoric and literary rhetorical devices. Evaluations were made using the institutions' statewide rubric and included points assigned for thesis statement, writing style, conventions and grammar, document format (MLA), organization, evidence and citation, word count, as well as following the specific instructions for each essay. The requirements for the essays were such that experimental group participants would need extensive interaction with the game content in order to write the essays.

This helped ensure that the participants actually interacted with the game/s, since these details could only be provided after intensive interaction with the game/s. The Introduction Discussion forum for the experimental group gathered information about the participant backgrounds, including prior gaming experience. Additionally, for this group, the Week 4 Discussion Forum asked students to talk about specific aspects of the game content and game play (if applicable), including information about the content's author, genre and purpose, intended audience, summary of the content highlights and main points, the evidence used to support these highlights, the most interesting details, the confusing and/or challenging parts, as well as the language, style, tone, and images.

### **Analysis Process**

In their handbook for mixed methods, Tashakkori and Teddye (2007) discussed the mixed methods approach in length, including advanced analysis mixed methods, and the issues of such approaches, with respect to data analysis. In Chapter 8, Creswell, Plano-Clark, Gutmann

and Hanson (2007) stated that, “Approaches to the data analysis also need to be sensitive to the design being implemented in a mixed methods study” (p. 232). Given that this study used convergent parallel mixed methods design (Creswell & Plano-Clark, 2011; Creswell, 2014), the assumption was that “both qualitative and quantitative data provide different types of information—often detailed views of participants qualitatively and scores on instruments quantitatively—and together they yield results that should be the same” (Creswell, 2014, p.268). In such a design, the two data sets are analyzed separately, followed by a merging of the results and then interpreting it. This can be done using a side-by-side comparison in a summary table as provided in the subsequent section.

For quantitative data, the essay grades were used to compare performance outcomes between the experimental and control groups. Inferential analysis, including Independent Sample t-Tests, Odds Ratio (OR), Effect Size, and other intervention effects were calculated using Statistical Package for Social Sciences (SPSS) software program and algorithms. A comparative statistical analysis was also made between the number of words written and the minimum required for four assignments (drafts and final versions of the two essays) to determine the scope of effort participants put into writing the essays, and the extent to which they went beyond the minimum requirements. The institution’s statewide standardized curriculum rubric uses word count as a measure of performance. As per the essays’ rubric, “Proportional points may be deducted for final drafts that do not meet minimum word counts”. Thus, even though meeting minimum word requirements is not rewarded in the rubric, not complying with it leads to negative grading.

Additionally, there is evidence in the literature regarding the use of word counts as indicators of performance related to motivation. Martin (2011) discussed a study done by Dona Cady in Middlesex Community College where using World of Warcraft in humanities courses resulted in students submitting longer papers than traditionally expected. In their report written for ETS, Chodorow and Burstein (2004) examined the effects of length when evaluating the performance of the e-rater system on prompt based essays written for computer-based Test of English as a Foreign Language. The report explained how variability in essay scores can be accounted for by essay lengths. Thus, we argue that using word count was a legitimate analysis method for this study to display students’ efforts in going the extra mile. Finally, an outside grader was used to evaluate the grades the instructor had given and report on the fairness of the grades, based on the rubric used. The outside grader did not submit separate grades, but matched the point values given to the de-identified essays with the rubric scales and determined if the grade accorded was fair or not. All grades accorded were determined to be fair, and no adjustments were made.

The qualitative data from the discussions and essays were analyzed, using a Thematic Analysis Approach wherein data was collected and classified for patterns, then identified for themes and sub-themes and finally reanalyzed to validate/justify the themes, and reduce data that was not pertinent to the theme (Attride-Stirling, 2001; Braun & Clark, 2006; Thomas and Harden, 2007). In order to provide rigor to this task, Saldaña’s (2015) recommendations for coding was used. Based on Saldaña’s (2015) suggestion that coders should look at “what strikes you” (p.18), the data was examined with an eye on critical elements relatable to the research question. The coding process was done as the data was gathered, and analyzed upon completion of data gathering. As part of the first cycle of coding, the lead researcher collected game related excerpts from the essays and discussions per participant, as they were being submitted. Once all data was thus compiled, a tracked changes feature in MS Word was used to develop the “first



cycle, descriptive coding”, using single words and phrases (Saldaña, 2015, p.3). Subsequently, the second cycle of coding was done to identify word and idea frequencies. A table of response data was developed to quickly access all the ideas and words. The third cycle of coding aimed to look for patterns by gathering ideas and words most used, and then combining them to form identifiable patterns. For example, based on words/phrases pertaining to the game content such as races, worlds, and customizing characters, the emerging pattern hinted that participants approved of the ability the game provided for personalization of such content. The fourth, and final cycle of coding determined the codifying that led to the categories discussed in the findings. Once the lead researcher coded the data for categories, the two co-researchers examined/coded the same data separately to verify the themes and patterns.

### Results

#### Research Question # 1: Performance Outcomes

The results suggest that MMOGs improve performance outcomes. The Alternative Hypothesis (HA) was that learners in DGBL environments do have higher performance outcomes than those in traditional learning. Due to directional approach for the HA, SPSS generated one-tail, independent sample T Tests for Experiment One and Two were used, since the samples came from different sections, and students were placed in experimental (using games) and control (not using games) groups, while the learners’ performance of the two were compared. Additionally, tests for odds ratio effect size and intervention effects were conducted. Alpha-level for both tests were set at 5% ( $\alpha = .05$ ). Confidence level for tests was set at 95%.

#### Essay Score Results

Table 1

*Statistics for EEM and CEM for Experiment One*

	Mean	SW Normality Sig	T-Test Sig (1 tailed)	Highest Values
EEM	85	.007	.314	198; 195;182;178;178
CEM	72	.021	.314	178;166;153;138;135

*Note.* EEM =Experimental English MMOGs; CEM = Control English MMOGs. The highest values are the top 5 for both (EEM) and control (CEM) groups that indicate higher performance level in EEM.

Data from all participants (n=32) is included, and there is no missing case. The mean for the experimental group (EEM) is higher ( $\bar{x} = 85.00$ ) than the control group (CEM) ( $\bar{x} = 72.00$ ). It is important to interpret results comprehensively, because meaningful interpretations regarding the value of effect sizes should be made on criteria beyond the conventional criteria of  $p < .05$  (Fidler, 2010). Based on this, Odds Ratio (OR) as well as intervention effects were calculated, since the study pertains to the examination of the success of an intervention over nonintervention (Durlak, 2009; Ferguson, 2009; Sullivan & Feinn, 2012). The effect size (ES) was calculated by considering the outcome being studied (Vacha-Haase & Thompson, 2004), and using Durlak’s (2009) category of raw mean differences to calculate ES for group designs. The following results were found:

- 1- To calculate the OR of the DGBL intervention, intervention effects as a proportion above or below a reference value were used (Lipsey et al, 2012; Szumila, 2010).

Using the Highest Value Results (see Table 1), 150 points was assumed as the cut off

- criteria, where the desired outcome was  $>150$  and undesired was  $<150$  points. The experimental group had five and the control group had three scores above 150. In the absence of a standardized threshold value, a determination was made to use 150 points as the threshold value based on average scores for the same assessments from previous semesters as suggested by Lipsey et al (2012) that “researchers may be able to identify meaningful threshold values for measures that do not already have one defined” (p. 17). The OR calculations  $((5/5=1)/(3/7=0.430))=2.33$  AND  $(5 \times 7=5)/(5 \times 3=15)=2.33$  results ( $OR=2.33>1$ ) indicate that the odds of having higher grades with the MMOG intervention are greater.
- 2- The highest values (see Table 1) for the experimental group are significantly higher than those from the control group. The distribution of the top scores indicate an equal level of performance, meaning all students in the top bracket of the experimental group had high scores as compared to the control group where the scores were a mixture of high and medium. While 100% of the top five experimental group students have scores above 150 points, only 60% of the top five in the control group have these.

### **Essay Word Count Results**

As discussed in the Methodology section, a comparative analysis of the number of words written and the minimum required for four assignments (drafts and final versions of the two essays) was done to see if participants went beyond the minimum expectations. Every participant's word count for each of the four assignments were calculated, compared against the minimum word count for the assignment, and the Odds Ratio determined for each. The threshold value was determined based on the minimum required word count. The desired value was determined as 100 points more than the minimum requirement. This was based on the fact that less number of students had more than 100 words beyond minimum requirements per draft, suggesting that to achieve this rate of words required greater efforts, thus making it a desirable value to express higher achievement. This provided an even more comprehensive and in-depth insight into the intervention and its effects on participant engagement. Below is the summary of results for all four:

Table 2  
*Summary of Results for Word Count*

Assignment	Threshold/Desired Value	Calculations	Results
<b>Draft-Summary and Response</b>	Minimum word count required = 600 Desired value =700	Experimental group (<600=2; 600-699 =3; 700-799=2; 800-899=2; >900=1) Control group (<600=2; 600-699=5; 700-799=0; 800=-899=1;>900=1)	The Odds Ratio was 3.5 in favor of the intervention $((5/5)/(2/7) = 3.5;$ $(5 \times 7)/(5 \times 2) = 3.5)$
<b>Draft: Rhetorical Analysis</b>	Minimum word count required =750 Desired value =850	Experimental group (<750 = 3, 750-849=3, 850-949=3, >950=4) Control group (<750 = 4, 750-849=1, 850-949=1, >950=2).	The Odds Ratio was 1.94 in favor of the intervention $((7/6)/(3/5) = 1.94;$ $(7 \times 5)/(6 \times 3) = 1.94).$
<b>Final Summary and Response</b>	Minimum word count required=750 Desired value =850	Experimental group (<750 = 5, 750-849=1, 850-949=2, >950=4) Control group (<750 = 5, 750-849=3, 850-949=2, >950=2).	The Odds Ratio was 2 in favor of the intervention $((6/6)/(4/8) = 2;$ $(6 \times 8)/(6 \times 4) = 2).$
<b>Final Rhetorical Analysis</b>	Minimum word count required = 1000 Desired value=1100	The experimental group had three desired and seven undesired, while the control group had nine undesired and two desired.	The Odds Ratio was 1.92 in favor of the intervention $((3/7)/(2/9) = 1.92;$ $(3 \times 9)/(7 \times 2) = 1.92).$

As evident from Table 2, the trend seems to be that participants performed better during the draft phases versus the final version. For the Summary and Response essay, the drafts presented a significant odd of 3.5 while for the Rhetorical analysis draft the odds were also significant at 2, in favor of participants using the MMOGs. In contrast, the odds for both the final versions were very close (1.94 and 1.92) for both essays, indicating that the performance was somewhat similar. This could be due to the assignment requirements and resultant challenges as the drafts were considerably simpler to write, with lesser constraints than the final versions. However, the point to be noted is that the overall odds, whether for the drafts or the finals, were higher in favor of the interventions.

**Research Question # 2: Participant Perceptions of MMOG Interaction Experience**

These findings apply to all four MMOGs, as participants expressed similar feelings with respect to the games of their choice. Providing choices allowed data to be examined across a wider range of games rather than limiting the focus to one game. This was appropriate given that one of the study's intent was not to test a single game, but to validate the Alternative Hypothesis in terms of MMOGs as a game type.

**Non-Active Game Content Is as Interesting, Or Even More, Than Active Gameplay**

The dialogues within the forums and some of the essay contents (pseudonyms have been used for confidentiality purposes), indicate that with respect to the MMOGs, participants were significantly influenced by the game content, even when not engaged in the actual gameplay. It appears that such content, even if it did not include active gameplay elements, was particularly interesting for the participants. Participants had several robust discussions about such content as the variety of characters, races, and classes, as well as world settings and locations. For instance, Erica mentioned how she was drawn into her selected game because, "It's really amazing the level of detail that the creators of these games put into the scenery, characters, and backdrop. I feel like very few games are as complex as these. In the game I wrote about, Age of Conan, you had 12 different races and 4 classes to choose from".

Based on a number of similar comments, it seems that factors such as the ease of browsing, content design including graphics, and clarity of description of different game elements were the most used criteria to select which game they wanted to use for the writing topic. For instance, Jenny explained "I also chose Rift and I found it interesting that there was so many ways to play. I liked the way they described the worlds just enough to get you interested in playing". This is an indication of the level of flexibility MMOGs offer as learners can have higher engagement just through browsing game content, even without being actively focused or concerned with the gameplay. As Melody explained, "The detailed story that is given is as you say, not really necessary to physically play the game but probably at least 25% of the audience that plays that games need the lore behind what they are playing".

**Interaction with Non-Active Game Content Is Interesting and Leads to Desire to Play**

An outcome of the interest in non-active content is that many of the participants who had never played games before, or did not like the idea of video game playing, discussed about wanting to play the game. One reason for this could be that these contents provide just enough information to act as a hook that leaves the viewers wanting to explore more and thus entertain the idea of actually playing the game. For instance, Charles mentioned how, "Personally, I was curious after reading the overview and now I want to play the game to learn more". Similarly, Jenny believed that "They describe just enough to so that you would be intrigued enough to check it out. It's interesting how they use the descriptions along with the graphics to paint an overview of the game in a way that you want to play it". When games are a part of the learning and assessment process, this extra push to explore and engage in gameplay can be positively beneficial.

**Personalization within MMOGs Induce Interest and Engagement**

Another key observation that participants made, almost unanimously, was that they felt more involved and engaged with the game content due to the personalization options the games provided. These ranged from a wide selection of skins or avatars (computer generated alternate personas), variety of characters, settings, roles, and different professions/craft selections that players can customize. Cassidy mentioned how she felt that "what was interesting about the characters was the variety of them. ... the player's ability to customize their characters is very

interesting and makes for what looks to be a fun game. In a similar vein, Jenny mentioned that “I think that is a big part of why some people choose to play these types of games, to be able to create their own world and characters”, while Charles agreed that “I think that the character creation is an interesting part of the game. It allows players to create a unique character that they can then use to go on missions and use in battle”. In fact, even though some of the participants had issues with their non-gaming background, they found the customization aspect interesting. As Sally articulated, “I am not interested in online gaming either so I find it interesting that there are so many options”.

### **Relatability of Game Content to Personal Life Creates Deeper Interest**

An interesting factor was how several participants discussed ways in which the game scenarios reflected aspects of their own lives or life in general. For instance, Kary stated that “the player gets to create and write the story as they go and that it fits into [sic] our daily life. The decisions that we make on a daily basis in our own life affects the outcome and how things go after that”. Similarly, in their response essays, Jenny mentioned that “While playing Rift you will also be learning how to make decisions based on certain situations that you are in, because like life, in Rift you sometimes don’t know where you’ll end up”, while Chuck described how, “These games teach you to use your imagination, or even better patience which is slowly diminishing in today’s society”. In the discussion forum Chuck contended that “To me this game is also a way to show and defend what you believe in. Showing people that they need to fight for what they want”.

### **Socializing Factors Make MMOGs Interesting and Stimulating**

Several participants agreed that the socialization factors within the games added to the interest, supporting similar ideas from other researchers. Additionally, there were comments refuting the notion of games creating anti-social or unsocial attitudes. The key elements in this context as discussed in the response essays were collaboration/teamwork, social outlet and wide range of interactions. In his essay, Charles mentioned that “Some people present the argument that playing video games makes a person antisocial. However, players often have to interact with each other in order to accomplish tasks in a game; this fosters collaboration and interdependence”, and how he believed that “playing video games with other players could also serve as a type of social outlet. Players can send private messages to each other, voice chat, or video chat”. Additionally, this socialization was not just for fun, but had real educational value. As Kary articulated in her essay, “You can also make new friends and learn about them and their beliefs and their country depending on where they live”.

### **Audio-Visual Elements Create Heightened Interest Factor**

Learners were unanimous about the impact of the audio-visual elements in the games. Tess described “all the thumps, cracks, and clangs of good old-fashioned swordplay, as well as ambient noises like wolves howling in the distance and the grunts and groans of your foes as you cut them to ribbons, all set to a breathtaking score”. Besides being an incitement to their visual and auditory senses, participants were also impressed with the level of work and commitment they believed the game developers had put into the design and publishing. In essence, the games were inspiring for the learners in several ways. “I personally noticed the amount of time and energy that was put into the game”, Beth wrote, “the creators of this game did such a great job...Just by signing in, you can instantly tell the great amount of talent that it took to make this game a success”.

### **Complexity of Game Design Can Create Difficulties, However Not Enough to Be a Deterrent**

For the most part, participants found the games to be entertaining, engaging and a creative way to learn and be assessed; however, they did share some concerns with some aspects of the experience. One challenge faced was the complexity of the game worlds and lack of sufficient direction to navigate within the game. For instance, Chuck mentioned, “the most confusing thing about the game is all the different worlds. I understand that Telara is the main continent but what are the worlds that go into making it that and how do you travel among them”. Jenny had similar views, “I liked the way they described the worlds just enough to get you interested in playing, but I also found that the way they talked about the different worlds was a little confusing”. However, these challenges may be due to the fact that most of the participants had little to no prior gaming experience, a fact which was repeatedly mentioned in the discussion. For example, Mimi said, “The most confusing thing about Tera is playing the game itself. I have no problem creating my character. But, I [sic] cannot figure out the multi-keys to attack the monsters and brutes”. Similarly, Viny mentioned, “The most confusing thing about Skyforge to me is how you actually play the game. I attempted and still didn't understand how to play, probably because I don't play any sort of game”. Being non-gamers could have also created an attitude of pushback against playing the game, just as Tess confessed, “I believe that I made it more difficult to understand the game because my mind was set on not to understand the concept of gaming”. However, the fact that participants continued to interact with the games and showed superior performance in their essay writing, suggests that the learning did take place, mostly through interaction with the game site's content.

### **Results**

#### **Synthesis of Qualitative and Quantitative Findings**

The purpose of using a mixed method approach in this study was to complement quantitative data with qualitative findings to gain a deeper and more comprehensive understanding of the phenomenon of using an MMOG based intervention in classrooms. Given the complexity of the phenomenon and paucity in the relevant literature, this was a necessary step for a strong study design. While the quantitative data indicated that there were definite improvements in performance outcomes for the experimental group versus the control group, the qualitative analysis provided several pointer as to why this could be, which supported existing literature and also added to it. The key factor in this was the element of motivation that the MMOG technology provided that could be deemed as the catalyst for the improved performances. There are discussions about the value of MMOGs as a motivational tool that engages users for sustained periods (ESA, 2016; SuperData, 2016; Yee,2006) and provides heightened engagement in increased informal social interactivity (Zhang & Kaufman, 2015). Other reasons that add value to the use of MMOGs in education are that they may offer superior challenges and levels of satisfaction (Hainey, Connolly, Stansfield & Boyle, 2011), provide the opportunity to enhance learners' cognitive abilities (Corredor & Benavides, 2016), ensure enhanced enjoyment as compared to other digital games (Suárez, Thio & Singh, 2013), create the possibility to enhance acquisition of skills and expertise (Schrader & McCreery, 2007), provide the option of being used as research and practice sites (Sykes, Reinhardt & Thorne, 2010), and provide leadership and socializing opportunities ( Lu, Shen, & Williams, 2014; Mysirlaki, & Paraskeva, 2012).

Table 3 provides a synthesis of the key qualitative findings and how they relate to the quantitative findings of higher performance and increased efforts, with supporting literature.

When examining the qualitative data from this study the following factors were offered by participants as crucial to their engagement with the games that perhaps steered their motivation to higher performance. This is based on the suggestions made by Creswell (2014) pertaining to the convergent mixed methods, which are: comparing different perspectives drawn from quantitative and qualitative data, explaining quantitative results with a qualitative follow-up data collection and analysis, and understanding experimental results by incorporating the perspectives of individuals. The foci of the study were to examine the effects that using free-to-play Massively Multiplayer Online Games (MMOGs) within an online English Composition course in a community college could have on learners' engagement and performance. Thus, the table fuses quantitative and qualitative information in terms of both performance and engagement. As Creswell (2014) states, "The key assumption of this approach is that both qualitative and quantitative data provide different types of information—often detailed views of participants qualitatively and scores on instruments quantitatively—and together they yield results that should be the same" (p.268). In the context of the study, the results showed that despite challenges, the effects were positive in favor of the MMOG usage. Creswell (2014) who discusses suggestions for merging, which include a called a side-by-side comparison, wherein the researcher first reports the quantitative statistical results and then discusses the qualitative findings. Additionally, Creswell (2014) talks of joint display in the form of a table or graph that can be "a table with key questions or concepts on the vertical axis and then two columns on the horizontal axis indicating qualitative responses and quantitative results to the concepts" (p.273).

Table 3

*Quantitative and Qualitative Findings Synthesis*

<b>Concepts</b>	<b>Qualitative</b>	<b>Quantitative</b>
MMOGs allow learners the opportunity for repeated readings that can lead to higher performance.	Learners indicated that interesting game contents, including audio-visual	As a result, experimental groups performed higher than control.
Repeated readings can lead to higher performance (Chafouleas, Martens, Dobson, Weinstein, & Gardner, 2004; Granic, Lobel, Engels, Anderson, N. B., 2014; Schlickum, Hedman, Enochsson, Kjellin, & Felländer-Tsai, 2009; Therrien, 2004).	components, and the associated engagement factors led to repeated interaction with and reading of such contents.	While 100% of experimental groups had desirable highest scores, only 60% of control group had the same.
MMOGs provide greater challenges, leading to greater motivation and engagement that effects performance in positive ways. The interaction between the activities and the external influences can create contradictions, which can generate extra challenges for participants. Several AT researchers consider contradictions to be tools of development as participants overcome	Challenges and complexities associate with game play can lead to heightened motivation. Learners had several challenges when interacting with the games, yet they continued to interact with the games and showed superior	The Odds ratio analysis indicates that the overall odds, whether for the drafts or the finals, were higher in favor of the interventions.

challenges and become more knowledgeable in the process (Antoniadou, 2011; Bonneau, 2013; Kuutti, 1995).	performance in their essay writing, suggests that the learning did take place, despite or perhaps due to the challenges.	
MMOGs allow learners to make personal connections and personalize their environment that could lead to higher performance. Relatability and personalized learning can lead to enhanced efforts (Conlan, Hampson, Peirce & Kickmeier-Rust, 2009; McClarty, Orr, Frey, Dolan, Vassileva & McVay, 2012). The Avatar system of MMOs can enhance efforts (Williams, Kennedy & Moore, 2011).	Learners indicated that they loved the fact that they could personalize and relate to life events and ideas, which increased their engagement and was reflected in their performance.	Both the essay scores, the Odds ratio and the word count scores indicate that experimental group performed better.
MMOGs allow for socialization that may positively impact performance. Socializing based motivation has a higher compelling impact on learners' efforts and performances (Boggiano & Pittman, 2010; Ke, 2009; Lee, Hwa Hsu & Chang, 2013; Peterson, 2013). Having a competitive essence in an activity may enhance engagement and allow learners to develop more effective problem solving skills and participate more robustly in uninteresting or mundane educational activities, which may lead to higher learning (Annetta, Minogue, Holmes, & Cheng, 2009; Burguillo, 2010; Jayakanthan, 2002; Ladd, & Fiske, 2003; Papastergiou, 2009).	Learner indicated that having outlets to socialize within video games enhanced motivation. In the context of the study, learners also had opportunity to learn through socializing via the discussion forums wherein they exchanged their feelings and ideas about the games and game based learning.	Both the essay scores, the Odds ratio and the word count scores indicate that experimental group performed better.

### Discussion

As is evident from the results, the use of multiple MMOGs raised learners' performances as compared to the control group performances. Not only did the experimental group have better overall essay grades, they also displayed superior efforts to go beyond the minimum expectations for their writings. This is contrary to students' behaviors in general when faced with writing assignments. In Higher Education, many students have issues with writing assignments, which they perceive are problematic in several ways including writer's block, hesitation, lack of proficiency leading to low self-esteem, and fear of failure. Based on these issues they are less apt to go beyond minimum expectations (Cai, 2013; Curry & Lillis, 2003; Hasegawa, 2013; Kalikokha, Strauss & Smedley, 2009; McCune, 2004; Pineteh, 2013).



The results are also significant when considering the experimental group's game related profile. Information from the introduction discussions indicate that 100% of the participants in this group had no prior experience with the specific MMOGs they had to work with. Only 12.5 % of this population had some prior gaming experience, making the majority of the group novices in terms of gaming. Thus, the challenges they faced were likely compounded by their interaction with a new technology and learning medium. Additionally, the course was delivered online where face-to-face scaffolds were not provided for the gaming, which increased the learning challenges for the participants. Despite these challenges, the experimental group outperformed the control group, indicating that the practical effects of the intervention were significant. This could be due to the inherent entertainment factor present within the MMOGs that acted as engaging hooks for the learners.

This is supported in literature, where it is suggested that due to this entertainment value, students may spend more time with a game compared to textbooks or articles (Annetta, Minogue, Holmes, & Cheng, 2009). "Computer games are regarded by some educationalists as highly engaging and it is hoped that by exploiting their highly compelling even addictive qualities that they can be used to help people learn effectively" (Hailey, Connolly, Stansfield & Boyle, 2011, p.2197). This is crucial to any DGBL approach, as learning may be directly proportional to the level of student engagement, both in terms of quantity and quality. Digital games such as MMOGs have high potential for such motivation and engagement (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005; Bogost, 2007; Griffiths, 2002; Hailey, Connolly, Stansfield & Boyle, 2011; Paraskeva, Mysirlaki & Papagianni, 2010; Zarranonandia, Diaz, Aedo & Ruiz, 2014; Snow, 2016).

As displayed in the synthesis section, the study's qualitative data suggests that MMOGs may produce a deep level of involvement, engagement and critical thinking that may extend beyond simple 'engagement due to entertainment' factor, adding to literature by displaying an extended scope of the engagement value of games to previous discussions of other researchers (Kim, 2010; McClarty, Orr, Frey, Dolan, Vassileva, & McVay, 2012). Based on such information, it can be assumed that MMOGs may be ideal for teaching and learning, as they can be powerful motivational tools within learning environments. Thus, studies on the effects of using MMOGs on motivation and performance in higher education settings can provide valuable insights, data and resources for educators on how to harness the technological powers of such games to enhance the learning process.

### **Conclusion**

In terms of research implications, there are strong indications that the DGBL based intervention using multiple MMOGs were successful in supporting higher performance scores and inciting high interest and engagement in participants as opposed to traditional teaching methods. This is valuable in terms of contributions to literature as well as future research options. Based on the success of the study and suggested value of MMOGs to enhance performance outcomes, it is recommended that further studies be continued to replicate the experiment. The study had some limitations in its scope, which creates opportunities for further investigation. This study focused on learners, and did not include the teachers' and administrators' perceptions, which may be crucial to get a deeper view of the value of DGBL interventions. The perceptions of learners with respect to autonomy was also not examined, which creates opportunities for future research to investigate to what extent having crucial choices effected learners' motivation and performance. Additionally, the number of participants

were small, and only one course discipline was used. Further studies need to be done to further our understanding of the value of MMOGs using more participants and other disciplines.

In terms of practitioners' implications, instructors should look to DGBL interventions as potential tools that can increase student engagement with their learning and assessment processes to a point where performance is positively impacted. In the context of game selection, as the study data suggests, MMOGs provide a large repository of useful teaching tools with the possibility of great impact in terms of engagement and performance outcomes. Research needs to be done on designing effective criteria for game selections across disciplines. This is a desirable approach given the paucity of such research at present. "...we must adopt interdisciplinary approaches to the study of DGBL. The answers to the most complex questions come at the intersection of multiple fields rather than from within any single one" (Van Eck, 2015).

To conclude, the ability of MMOGs to be used as an educational tool is possible due to the flexibility and heightened engagement such games offer. This study provided a positive input regarding the benefits of using MMOGs to enhance student performance and engagement. This input creates opportunities for more extensive and intensive research into the interdisciplinary value of MMOGs. DGBL strategies offer multiple ways to tap into instructors' and course designers' creativity and drive to be innovative, while providing stimulating and meaningful experiences for learners.

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