

E-Games and Linguistic Intelligence on Students' Receptive Skills

Rizza Ramos Consad
Center For Innovative Teaching and Learning
Bukidnon State University
Malaybalay City, Philippines

Abstract:- The question how computer games as a language environment influence learners has spurred this investigation to examine whether e-games influenced first year students' receptive skills, i.e., reading and listening comprehension skills when they were grouped according to their linguistic intelligence. This study used the mixed method: drawing from quantitative and qualitative data in arriving at answers. The weighted mean was used to identify the listening and reading proficiency and the linguistic intelligence levels. Chi-square was used to identify whether e-games and linguistic intelligence influenced the receptive skills. Qualitative data from separate focus group discussion with students were conducted to substantiate the quantitative data. The results showed that linguistic intelligence affected the students' receptive skills while exposure to e-games or computer games did not.

Keywords:- E-Games, Electronic Games, Computer Games, Linguistic Intelligence, Listening Comprehension, Reading Comprehension.

I. INTRODUCTION

What started as a simple tic-tac-toe game created by Douglas in 1952 as a first graphical computer game and Russell's *Spacewar!* has now evolved into various cutting edge visually enhanced *real time strategy games* played on personal computers to smaller digital gadgets like Play Stations, Ipad, and cell phones, not diminished in quality whatsoever. The World Wide Web not only allows computer gaming a global social network captivating gamers of different demography, but also opens the debate on the value of these games to language learning and other skill development relevant to academic success of students (Farington, 2011; Honey & Hilton, 2011; Mayer, 2011). The question of how e-games as a language environment influence learners has spurred studies as this ubiquitous technology flourished.

Recent studies like Borgonovi's (2016) revealed that though excessive gaming may hinder academic achievement, but moderate gaming can result to some positive outcomes based on a representative sample of 145,953 students from 26 countries that used the Programme for International Student Assessment (PISA, 2012) with self-reports on use of video games. Similarly, Drummond &

Sauer (2014) analyzed data from over 192,000 students in 22 countries involved in the 2009 PISA. Data showed that gaming behaviors of students did not adversely affect their academic performance in science, mathematics, and reading.

However, Hastings, Karas, Winsler, Way, Madiga, & Tyler's (2009) study concluded that a large amount of game play was correlated negatively to academic outcomes among young children. Bussiere and Gluszynski (2004) investigated the impact of Information and Communication Technologies (ICT) on the reading performance of 15 year-old Canadians and found out that the occurrence of computer gaming and using the Internet were not significantly correlated with reading skills. Likewise, Radi (2002) studied whether the increase use of computers and gaming at home and school influenced junior high school students' development of literacy in reading comprehension and vocabulary skills; findings showed that computers might be detrimental to the development of basic language literacy skills. With the various results of these studies throughout the years, e-gaming may be viewed as a threat to schoolwork and learning since much time is spent on entertainment media and the games' lack of educational content or it may be a pedagogical tool to achieve academic outcomes.

Likewise, teachers have varying opinions regarding electronic games. In a survey conducted by the researcher among teachers teaching first year college students, some teachers observed that students who were penchant to computer gaming or e-games lagged behind in their class performance like unable to pass assignments and unprepared for examinations, thus resulting to low performance. These behaviors created a negative perception towards gaming among teachers. On the other side of the spectrum, there were also those who identified the value of these games to learning. These teachers opined that these student-gamers had good problem solving and analytical skills since the games allowed them to think strategically to unlock difficulties or progress through levels.

Most teachers expressed, however, their lack of technical skills to incorporate commercially-produced games in the classrooms. Most of them preferred to use other Information and Communication Technology (ICT) tools such as powerpoint presentations and the more accessible platforms like Messenger, Google classroom, and

the like. On the outset, most of the teachers are still undecided on the pedagogical functions of these games with the intent to improve language learning.

This study would like to contribute in identifying the potentialities of these games in education. With this premise, this study examined the listening comprehension skills and reading comprehension skills of student-gamers and non-gamers when both groups were classified based on their linguistic intelligence. Further, it identified whether e-games and linguistic intelligence influenced these receptive skills.

II. STATEMENT OF PROBLEM

The study examined whether e-games and linguistic intelligence influenced students' receptive skills. Specifically, it answered the following questions:

1. What is the listening and reading comprehension proficiency levels of students who are exposed to e-games and those who are not with high and low linguistic intelligence?
2. How do e-games and linguistic intelligence affect the students' receptive skills?

III. HYPOTHESES

1. There is no significant contribution of exposure to e-games to students' receptive skills.
2. There is no significant contribution of linguistic intelligence to students' receptive skills.

IV. LITERATURE REVIEW

A. *Connectivism, a Theory for the Digital Era*

With the unique environments learners expose themselves to, Siemens (2004) proposes a theory of learning for the digital era—Connectivism. This learning theory is often referred to as “networked learning.” Learning occurs when an individual connects himself/herself to a learning community, called a *node* which is always a part of a larger network. Networks have connection points that create other nodes, and these nodes may be linked to one another to share resources. Siemens (2008) believes that there is a shift from instructor or institution-controlled teaching to a learner-centered acquisition of knowledge wherein the learner has the greater control on what to learn and where to acquire learning, not confined by geographical boundaries.

This organization or network disseminates knowledge and keeps it in a variety of digital formats. The existence of the Internet allows the sleepless, borderless, and limitless access to learning and knowledge to geographically separated individuals, connected with the same interest or connected when in search for information. Siemens believes that computers provide the venue for the exchange and creation of information, a platform for “social distribution of cognition.”

Therefore, the learning process is learner-centered; the learner is responsible for weighing the value of knowledge he or she gains. Siemens (2008) explains the skill needed in the development, distribution, and acquisition of knowledge. Siemens further expounds (2004) that this skill has to be present in the learner even prior to the actual learning; the ability of synthesizing and recognizing connections and patterns is an essential skill in today's digital learning. The bulk of information provided by the digital world is so vast and the speed of new information gets through the networks is so rapid that this skill is a requirement for learning. This theory is relevant to the present study since it expounds the prevalent scenario in the digital world—“networked learning.”

B. *E-games, Computer Games, and Video Games*

This theory closely relates to the concept of e-gaming since it is a network activity where there is an exchange of information, ideas, and feelings amongst its users exist. Computer games, video games, or electronic games are now synonymous because of the blurring boundaries between computing and video technology (Mitchell and Cavill-Smith, 2004). In this study, e-games is used for uniformity of terms referring to all games classified under this term.

Frasca (2001) as quoted by Newman (2004), these are “forms of computer-based entertainment software, either textual or image-based, using any electronic platform such as personal computers or consoles and involving one or multiple players in a physical or networked environment (p.4).” These games allow participation of the gamer or gamers into a virtual environment as provided by the software. These are different formats like hand-held one-player models, cartridges, or compact discs that are slotted in a component attached to television sets, or a network of computers, “freestanding” arcade units, and applications in smartphones.

Newman (2004), adapting Howland's (1998) elements of these games, described the elements as follows: graphics, images that the gamer will see, 3D objects, 2D tiles, 2D full screen shots, full motion video, statistics, and informational overlays; sound, any music or sound effects played during the games; interface, the menu and tools the gamer needs to navigate the game; gameplay, the entertainment, immersion, and the length of playability; and the story, the narrative before the game starts and all information the gamer gains as the game progresses.

Kaptelinin and Cole (2001) categorize these games into action, adventure, fighting, platform, knowledge, simulation/modeling/role-playing such as strategy games, drill and practice, logical and math games. With the advanced gaming technology, many of these games appeal come from the synchronization of flashing lights, a variety of sounds, and movie-like animated action. Some of these games have numerous levels and interweaving game plots requiring many hours to finish. The presence of these elements explains the strong proclivity of young and old alike in their engagement to these games.

These games may be played among several gamers or an individual against the gaming system's artificial intelligence. Other internet-based games called massively multiplayer on-line games (MMOGs) allow thousands of individuals communicating through their "avatars" (representative icons or animated computer characters) and exploring virtual worlds (Lowood, 2019). The creation of new and improvement of existing games and the enormous number of gamers worldwide show the impact of gaming as an entertainment medium and as an educational tool for some.

C. Linguistic Intelligence

Gardner (1983) defines linguistic intelligence as not only solely on the aptitude of a person in learning another language but also the use of his own native language or other languages for certain purposes. This intelligence means that one successfully use the language to verbalize one's thoughts and ideas in different contexts as well as recalling information with the use of language.

He expounds four aspects of this intelligence. The first one is the ability to use language to persuade other people to action. The second aspect is the mnemonic potential of language or the ability to use language to remember for information such as finding one's way in an unfamiliar place or playing a game. Next characteristic is its role in explanation, that is, language is used in teaching and learning. The ability to explicate ideas and the ability to understand given inputs require linguistic aptitude. The last aspect is the ability to use language to analyze language. It involves meta-linguistic analysis or simply thinking about the meaning of what one has just uttered.

Gardner (1983) recognizes that people who have linguistic competence possess "varying significant degrees" of sensitivities to language. For example, a person who has a strong inclination to reading, may be a poor story teller. This shows that individuals with linguistic intelligence may show differing competences. This important concept is necessary since the study identified the students' level linguistic intelligence whether they had high or low linguistic intelligence.

D. Receptive Skills

Receptive skills pertain to listening and reading; learners do not produce language to perform these skills rather they receive and understand language. Snow (2002) describes reading comprehension as "the process of constructing and extracting meaning is the process of simultaneously constructing and extracting meaning through interaction and engagement with print." It is a multifaceted, dynamic process wherein understanding what one reads is the ultimate goal of every reading experience. Reading comprehension skills include noting details, getting the main idea, sequencing events, identifying cause and effect, predicting outcomes, drawing conclusions, and identifying author's purpose. These skills allow learners to make sense of printed language.

On the other hand, listening is the receptive skill in the oral mode. This means that one understands what one hears. This involves skills in comprehending the messages received. Rost (2002) defines listening as a process of hearing what a speaker utters (receptive orientation); creating and denote meaning (constructive orientation); negotiating meaning with the speaker and reacting (collaborative orientation); and, making meaning through participation, imagination and empathy (transformative orientation). A listener would either use his/her linguistic knowledge to understand aural input (bottom-up process) or activate his/her schema or background knowledge to comprehend what is heard. This shows that listening is an active mental process of decoding and understanding what one hears.

V. METHODOLOGY

This study utilized the mixed methods approach in which the quantitative and qualitative data were collected, analyzed, and combined to provide a better understanding of research problems (Creswell, 2014). This study specifically used the triangulation design. The quantitative data were gathered through researcher-made tests to identify receptive skills and an adapted questionnaire on linguistic intelligence of students both e-gamers and non- e-gamers. Qualitative data from the focus group discussions with students were used to substantiate the numerical results. Also, the researcher followed the research and development design in the construction and validation of the reading and listening comprehension proficiency tests.

The respondents of this study were the first year college students of Bukidnon State University. These students were enrolled in various degree programs with different fields of specializations; their ages ranged from 16 – 27. Five English teachers handling first year students were selected to participate in the focus group discussion. Their teaching experience ranged from 17 years to four years; their educational qualifications include being masters and doctoral degree holders.

To get the sample population of this study, the sample size formula for normally distributed population was used. The result gave 663 as the sample size. From 663, the Rogers Indicator of Multiple Intelligences (RIMI) determined the students with low and high linguistic intelligence. Basing on the Roger's Indicator of Multiple Intelligences and simple survey on who were computer gamers and non-computer gamers, there were 31 computer gamers; 11 of these were categorized with low linguistic intelligence (LI) and 20 with high linguistic intelligence; and there were 39 non-computer gamers; out of these students, 14 were classified with low linguistic intelligence, and 25 with high linguistic intelligence.

The listening and reading comprehension proficiency tests were research-made with alpha Cronbach reliabilities .70 and .79 respectively. These tests were also content-

validated by experts and revised based on the evaluation and results of the index of difficulty and index of discrimination. These were used to identify the receptive skills of the learners. The weighted mean was used to identify the proficiency levels and the linguistic levels and chi-square was used to identify whether e-games and linguistic intelligence influenced the receptive skills.

VI. RESULTS AND DISCUSSION

This study aimed to identify whether e-games and linguistic intelligence influenced students’ receptive skills. This study further ascertained the contributory factors influencing the students’ receptive skills. Table 1 reveals the students’ proficiency levels as they were grouped according to their linguistic intelligence levels and e-gaming exposure.

	LC mean score	Proficiency Level	RC mean score	Proficiency Level
e-gamers high LI low LI	19.31 18.36	<i>very proficient</i> <i>proficient</i>	21.15 20.00	<i>proficient</i> <i>proficient</i>
non-e-gamers high LI low LI	18.88 15.71	<i>very proficient</i> <i>proficient</i>	22.24 17.64	<i>very proficient</i> <i>proficient</i>

Table 1:- The Students’ Listening (LC) and Reading Comprehension (RC) Skills Proficiency Levels as Grouped According to their Linguistic Intelligence (LI)

As shown in the table, both e-gamers and non-e-gamers with high LI are *very proficient* in listening comprehension, and those with low LI are *proficient*. These learners with high LI have more significant abilities in understanding verbal language compared to those with low LI. In reading comprehension, e-gamers with high LI and low LI are *proficient*. While, non-e-gamers with high LI are *very proficient* and those with low LI are *proficient*. Learners with high LI who are not exposed to games have significant abilities in reading comprehension. Regardless of the level of the linguistic intelligence of e-gamers, their reading comprehension proficiency level are the same, i.e., manifesting adequate abilities in understanding written texts.

A. e-Games on Students’ Receptive Skills

Table 2 reveals e-games relationship to the students’ receptive skills.

Exposure to e-Games	Receptive Skills			Correlation Coefficient (P-value)	Decision
	Skills	Mean Score	Description		
e-Gamers	Listening Comprehension	18.966	<i>Proficient</i>	0.201 (0.178)	<i>Not Significantly Related</i>
Non-e-Gamers		17.744	<i>Proficient</i>		
e-Gamers	Reading Comprehension	18.967	<i>Proficient</i>	0.036 (0.808)	<i>Not Significantly Related</i>
Non-e-Gamers		20.590	<i>Proficient</i>		
e-Gamers	Total Receptive Skills	18.340	<i>Proficient</i>	0.123 (0.386)	<i>Not Significantly Related</i>
Non-e-Gamers		17.696	<i>Proficient</i>		

Significant at 0.05 level

Table 2:- Exposure to e-Games in Relation to Students’ Receptive Skills

The results reveal that exposure to computer games is *not significantly related* to the students’ listening and reading comprehension proficiency levels. Whether a learner is a gamer or not, computer gaming does not influence his/her proficiency in both receptive skills at all. Further, this result shows that computer games’ linguistic inputs may not be sufficient enough to affect the receptive skills of the students. The instructions on screen, the background stories of the games, and the conversations among the players either encoded or spoken may not be accessed by gamers all the time. Some players interviewed stated that they did not read the background stories, and when they understood the game play, they did not rely too much on the instructions, but made their own decisions in the game. Though they communicated with other players, these were short sentences and were only given when necessary.

Also, the highly interactive games engaged the gamers into the play so much that whatever textual inputs these games have, these are not stored in the short-term memory, which is in charge of information to be readily retrieved. In other words, the nature of the games overrides the linguistic inputs. These e-games are designed with a movie-like animated action synchronized with variety of sounds and auditory instructions and interactions. The achievable complexities of the games on the backdrop of visuals and sounds may prevent possible language inputs to be processed by the gamers, thus, inhibiting the gamers from benefitting linguistically, in terms of receptive skills.

The result somehow contradicts with Cruz’s (2006) observations on computer games that they have “potential as a language development and enhancement tool.” He opines that the interaction between the characters and the gamers exposes the gamers to the language thus developing language skills. Placing this observation on the context of this research, the aural inputs received by gamers are not as significant as to affect their listening and reading proficiency skills.

This result is in consonance with Bussiere and Gluszynski’s (2004)’s findings that computer gaming as an ICT variable was not significantly correlated to reading skills. In like manner, Radi’s (2002) investigation on

increased use of computers, including gaming, and literacy development in reading and vocabulary skills showed that computer use might show a negative impact on young people’s developing basic language literacy skills.

The researcher concurs with the the term used by Prensky (2006) to refer to the learners today, digital natives, who have grown with the ubiquitous technological environment—presence of cellphones, Ipad, Ipod, computers, and Internet—and how they may think differently from their predecessors who grew with print media. The results, however, do not recommend the use of commercially-produced games in the enhancement of listening and reading as opposed to Prensky’s (2006) proposal on the use of computer games in language teaching. These may also refute Ang and Saphiris’ (2008) claim on the educational potential of games in language learning since the results reveal that computer gaming fails to contribute to the receptive skills of students.

The results neither dispute e-games’ value in developing other skills such as problem-solving and the emerging visual literacy (Bleed, 2005). According to Bleed (2005), visual literacy has emerged because of the proliferation of media; one of the strongest forms of digital media is the computer games. The visual stimulation of this medium allows different skills being learned like comprehending representational, explanatory, abstract, and symbolic images, applying knowledge on electronic media, and communicating effectively through visuals (Bleed, 2005 quoting enGauge Report). Based on these notions, the results do not refute connectivism, as a theory of the digital age since there are sets of skills that may have been developed by these gamers. Siemens’ (2004) belief that learning resides in networks like how e-gaming creates community of gamers as a venue for learning skills.

The hypothesis, there is no significant contribution of exposure to e-games to students’ receptive skills is, therefore, is *accepted* because the results show that exposure to e-games is not significantly related to the receptive skills

B. Linguistic Intelligence Influence on the Students’ Receptive Skills

The implications discussed in the previous sections on the possibility of linguistic intelligence’s influence on the receptive skills of students are affirmed in Table 3 below. The table shows the results of the influence of linguistic intelligence to the receptive skills of students.

TABLE 3. Linguistic Intelligence in Relation to the Students’ Receptive Skills

The result reveals that linguistic intelligence is *significantly related* to the listening and reading comprehension proficiency levels of students when grouped according to high and low linguistic intelligence regardless of e-gaming exposure. This shows that linguistic intelligence influences the receptive skills of the students. As shown on the table, the students with high LI had a higher proficiency level compared to those with low LI, and both groups’ receptive skills were influenced by their linguistic intelligence. This indicates a connection between LI and receptive skills.

Studies by Rahimi, Sadighi, and Fard (2011) and Sriadi (2012) share the same result with the present study. Rahimi, et al (2011) found out that students with high linguistic intelligence demonstrated higher reading abilities, and LI was a strong predictor of reading performance. Sriadi’s study yielded the same results that students with high LI and low LI who were taught the same reading strategy performed differently in a reading test. Students with high LI had higher scores while those with low LI had lower scores. In like manner, LI also correlated with listening comprehension as revealed in the study of Babak (2008) who investigated the role of the multiple intelligences in students’ listening proficiency. He found out that LI was a factor of TOEFL and IELTS listening scores while other intelligences were not. The data revealed that only LI had a statistically significant contribution to listening proficiency. These studies strengthen the findings of this study that, indeed, linguistic intelligence influences the receptive skills.

According to Gardner (1983), one aspect of linguistic intelligence is the ability to use language to analyze language, thus involving meta-linguistic analysis on what is heard or read. One’s competence in a language assists an individual in decoding oral or written inputs; in fact, the ability to understand given inputs requires linguistic aptitude. Listening is a linguistic skill that allows one to understand aural inputs. Nunan (1997) identifies that the two-processes that comprise the listening process are necessary. The bottom-up processing is language-based; one decodes the sounds into words and words into phrases, and phrases are combined to create sentences. Then, sentences are put together to form comprehensible texts. This process is sequential wherein the meaning is derived at the last step of the process (Nunan, 1997). This premise indicates the linguistic aptitude in listening comprehension.

This process associates with linguistic intelligence as LI’s areas of sensitivities are on phonology, combining sounds to form words; syntax, ordering of words in sentences; and semantics, putting sentences into meaningful whole. This just shows the correlation of bottom-up processing and one’s linguistic aptitude or potential. The other view of listening process is the top-down processing. The listener uses incoming sounds as clues, and taps “prior

Linguistic Intelligence	Receptive Skills			Correlation Coefficient (P-value)	Decision
	Skills	Mean Score	Description		
High Linguistic Intelligence	Listening Comprehension	19.068	Very Proficient	0.402 (0.006)	Significantly Related
Low Linguistic Intelligence		16.880	Proficient		
High Linguistic Intelligence	Reading Comprehension	21.727	Very Proficient	0.430* (0.001)	Significantly Related
Low Linguistic Intelligence		18.680	Proficient		
High Linguistic Intelligence	Total Receptive Skills	18.846	Very Proficient	0.423* (0.001)	Significantly Related
Low Linguistic Intelligence		16.464	Proficient		

*. Significant at 0.05 level

knowledge of the context and situation within which the listening takes place to make sense of what he or she hears (Nunan, 1997).” The listener reconstructs what he or she hears by activating background knowledge, and considering the situation or context where the input is heard, the type of the oral text, and the language. Even in this processing, characteristics of linguistic intelligence are present. Thus substantiating the result, LI influences listening comprehension.

On the other hand, reading is a complex cognitive process by which a person derives meaning from text. Owen (2010) further describes it as “the synthesis of a complex network of perceptual and cognitive acts along a continuum from word recognition and decoding skills to comprehension and integration.” Reading involves steps to comprehend what one reads, and linguistic intelligence influences that process.

Owen (2010) traces the reading process starting with the decoding of the print that involves the breaking of a word into its parts like sounds and putting these sounds to create a decipherable word. The brain has the capacity to identify sounds and put the sounds together to create meaningful words. In relation to LI, one area of sensitivity is phonology (Gardner, 1983). Based on grammar, word meanings, and context, these words are interpreted and comprehended. These components like grammar or syntax; word meanings, pertaining to semantics; and the context or pragmatics, are areas of sensitivity for linguistic intelligence as well. Reading is basically a complex linguistic process interplaying with linguistic intelligence.

Konza (2011) elucidates that “comprehension requires engagement with the text at a deep level, and an array of skills that go far beyond simple word recognition.” And, these skills include relevant background knowledge of which the schema theory describes as an essential tool in comprehension, familiarity with semantic and syntactic structures, and verbal reasoning. All these pertain to areas of sensitivity of linguistic intelligence. Gleaning from Konza’s (2011) statement, it can be surmised that there really is a connection between LI and reading comprehension.

The hypothesis, there is no significant contribution of linguistic intelligence to students’ receptive skills, is therefore, *rejected* because the results show that linguistic intelligence is significantly related to the receptive skills proficiency levels of students.

VII. CONCLUSION

Based on the findings, the following conclusion is drawn: linguistic intelligence is a predictor of students’ receptive skills for both e-gamers and non-e-gamers, whereas e-games do not predict the skills. E-games’ highly engaging visual and interactive environment may undermine potential linguistic inputs beneficial for the gamers. A different set of skills may have been developed by this group of learners. Also, non-e-gamers may have developed

their linguistic, formal, and content schemata through exposure of the language in various experiences and interests. It is then recommended that since linguistic intelligence influences the receptive skills of students, activities that further develop and foster this intelligence be utilized in and out of the classrooms. Also, a research may be ventured to explore other factors such as visual literacy to identify how this influence the receptive skills among e-gamers.

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