Gaming: A gateway to Second Language Vocabulary Acquisition: An Annotated Bibliography

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Abstract

In today's day and age, acquisition of a second language is considered an essential in the journey of seeking education. The increasingly growing connections of the world leading to mass globalization through cross-cultural interactions has laid down the need for multilingualism. Hence, in the competitive global world, the demand for proficiency in multiple languages has risen and contributes massively to one's marketable skills. Additionally, multiple researchers prove the benefits of multilingualism beyond the general acquisition of a language, which includes improved cognitive development, enhanced problem-solving skills and better cultural perception and awareness, just to list a few. Hence, bubbling the need for the acquisition of a second language.

Keywords: Second Language, Vocabulary Acquisition, Annotated Bibliography

Introduction

Moreover, in the concoction of globalization, another way the world has been constantly morphing is the rapid development and adaptation of technology. In the current lifestyle, the use of technology is in tandem with the everyday way of life. The realm of education is no exception as it also undergoes transformations that evolve and incorporate the modern ways of the digital age, such as the utilization of Zoom as a method to continue the educational path through the use of cyberspace despite the hindrances in the physical realm caused by the spread of the Covid-19 pandemic. This change has not only changed the means of imparting knowledge but also has changed the preferences of modern learners as digitized education platforms become more of a lifestyle for learning. Consequently, among these innovative methodologies, gaming is thought to be a valuable tool to assist in the mission of knowledge acquisition. Therefore, games can be utilized for the task of learning and teaching a second language.

The majority of the young generation of today inclines towards gaming as a means of entertainment, therefore, making gaming an ideal conduit for language learning. One can utilize the contextual and interactive nature of games to expose learners to second language

vocabulary, which can be more engaging and effective compared to rote learning systems with context lacking textbooks. These immersive experiences through games can prove to be more interesting as well as productive, and might increase motivation for studying vocabulary of a second language.

As universally known, vocabulary serves as the foundational building blocks of any language on top of which proficiency is constructed, leading to understanding, expression and hence communication in that language. Gaming could be utilized as a gateway to expose and teach learners vocabulary in ways that resonates on a deeper level with the learner. Unlike textbooks, games provide environments, stories, characters and settings that can help in contextual vocabulary learning which can be a lot more enjoyable as well as effective compared to the more conventional means of education through verbose textbooks. This paper seeks to delve into the emphasis on the creation of a symbiotic relationship of second language learning and gaming.

Annotated Bibliography

Chen, H.-J. H., & Hsu, H.-L. (2020). The impact of a serious game on vocabulary and content learning. *Computer Assisted Language Learning*, *33*(7), 811–832. https://doi.org/10.1080/09588221.2019.1593197

In the present day, computer games are being used by a lot of researchers in learning. It can be due to the reason that it is one of the bigger industries in the world with huge revenues (Newzoo, 2007). The subject matter of these games can range from a number fields such as psychology, medicine, nutrition to even language and history. Such games that are developed purely for the sake of learning, education and training are called serious gaming. One of the emerging research on these games that deal with language learning which is being called Digital Game Based Language Learning or DGBLL. Researchers argue that games provide the learners with intrinsic motivation (Dornyei, 2014; Ushioda & Dornyei, 2011)and more interactive experience than traditional learning as it gives the learners a fun experience and therefore less anxiety (Peterson, 2016; Reinders, 2012). Many researches show that gaming has helped a lot in improving the learning performance with enhanced levels of communication skills ranging from increased level of vocabulary to even picking up foreign languages as well as higher level of cultural knowledge and sensitivity. The research questions focus mainly on whether the participants can learn new words, gain historical facts and what thoughts about this type of gaming?

A total of 66 non-English major students; 26 males and 40 females, were selected in a national university in Taiwan. The nineteen years old students that participated were at higher intermediate level of English language proficiency which equates to CEFR B2 level. 'Playing History' was chosen as it is specifically designed as an Interactive Serious Game which involves collecting information, objects and complete missions in a historical setting. The game has 3 episodes out of which only the second episode called 'Slave Trade' was chosen. The progress of the students was monitored by the teachers while also having access to topic materials, manuals, assignments as well as the duration of play of each student and the number of tasks completed.

For the study on vocabulary knowledge, a pre and post-test were conducted which required the students to write the meanings of the English words attained in Chinese. AntConn 3.4.4

(Anthony, 2014) was employed to derive a table of the numbers of times a word is used and out of this 60 words were chosen and divided into three parts on the account of their frequency. 14 words appeared 6 or more times and were dubbed high frequency, 34 words repeated 2 to 5 times and were named intermediate frequency while 12 words that appeared in the game only once were called low frequency. For the study of historical knowledge, another pre and post-test were conducted which had two sections using 4 short questions and 6 multiple choices questions regarding Atlantic Slave Trade. For a partially correct short question, half score was allotted. Whereas for the students opinion on such kind of learning, a survey was utilized to check their views on vocabulary, history and the game as a whole. The researchers introduced the game to the participants as well and then let use play on their own.

The comparative analysis of the pre and post results of vocabulary test show a big difference. The mean pre-test score for low frequency words is 23.28, for intermediate frequency is 18.85 and for high frequency, the score is 23.09. The mean results of post-test show that the score for low frequency words has improved to 40.94, the mean score for intermediate frequency words is 40.26 and the mean score for high frequency words have been raised to 51.46. Such an improvement could be attested to the rich context (deHann, 2005; Zheng et al., 2015) and multimedia annotation (Ranalli, 2008) as gaming provides much more ways for language input such as listening, readings, visuals, hearing the words in a dialogue with proper context which then helps in 'deep learning' (Gee, 2007). The results show that a frequency of a word is directly proportional to the learners, ability to recall a word with either higher productive knowledge or just receptive knowledge (Webb, 2007). At the same time, the higher score in intermediate and low frequency words can also be because of incidental learning (Horst & Meara, 1997; Webb, 2007) or because of 'meaningful context' (Bisson et al., 2014).

The score of acquired history knowledge also showed a significant improvement where mean pre-test score was 37.42 and the mean post-test score was 53.94. The students' survey also showed a positive inclination where the first part of the survey was also counter checked for validity and found reliable. The survey depicted that students were much more in favor of learning vocabulary and history in such a manner while some also had some suggestions for improvement in the game design. The students agreed that the game design also helped them decipher meanings of different words on their own while they were kept motivated by the series of mission and objectives that helped improve their reading skills too while some mentioned that the words with visual aid or something to do with the mission helped them remember better. The survey also shows improvement in listening skills where students needed to listen to an accent they were not used to thus needed much more concentration while enhancing their listening ability.

With the results of the studying showing such a remarkable improvements, it can be said that gaming can be fun and educational at the same time and a further research can also be conducted on how much the frequency of words occurring in a context affects the word knowledge. At the same time, there also some limitations to this study regarding the gaming ability of different students as well as the testing material. As the pre and post-test utilized the same words so a delayed post-test could have been better to examine how well the vocabulary attained in the serious gaming could be recalled.

Most of this research is very particular with extensive explanation of the methodology and instruments which helps in understanding the entire study in a very good manner, the game selected for the study is already award winning in Europe and is famous for its effectiveness enough for it to be mentioned on famous media sources like CNN and BBC. This study reinforces the idea that gaming can be used as an educational tool and serious gaming does not have to take out the fun from this element as it serves as a tool of motivation for the learners.

It is also worth noticing that the participants selected were already at a higher level of English language proficiency that could be also be one of the factors that contributed to the higher scores as the level of difficulty is too level as the game is designed for four to six years old as the portfolio page of the selected game mentions (https://www.seriousgames.net/en/portfolio/playing-history/). At the same time, the researcher uses a variety of sources to strengthen their claims and make uses of a cross references as well which further validates the studies. There is a minor projecting towards the end of the study in the student's feedback on the game design.

Through interactive gaming, the students involved in the present study experienced inequality when they had to follow the master's orders, felt terrified when the protagonist was put into a very small cabin on the way to Africa, and felt desperate when the protagonist could not save his sister's life (H.-J. H. Chen, & H.-L. Hsu, 2020, p. 825).

Many researches have been conducted on the subject but this one provides a mostly objective view while the limitation is also mentioned along with the possible remedies. This research also further strengthen the idea that with modern education where a lot of education has been online since 2020, serious gaming is one of the useful tools that can be successfully employed in the classroom and be used to monitor the students' improvement in the subject matter while also providing supplementary lessons where necessary.

David O. Neville, Brett E. Shelton & Brian McInnis (2009) Cybertext redux: using digital game-based learning to teach L2 vocabulary, reading, and culture, Computer Assisted Language Learning, 22:5, 409-424, DOI: 10.1080/09588220903345168

In this crucible of digitization and innovation, the use of technology, particularly Digital game-based learning (DGBL) has gained traction in second language acquisition (SLA). Therefore, through this research the authors sought to explore the use of Interactive Fiction (IF) games designed for teaching German to university students and assess its effectiveness in comparison to more traditional means of learning a second language. Their work examines the differences and benefits of DGBL, emphasizing IF game's potential and supporting DGBL's utilization in SLA pedagogies. They report the findings of their experiment of mix-method learning by providing a comparison of Game based learning versus traditional printed-text based learning, when applied to second language learners.

With the use of qualitative measures (vocabulary retention) and quantitative assessments, combined with the ARCS model by Keller (1983), the authors evaluated the correlation between a learner's immersion in German culture, their improved vocabulary retention and knowledge transfer with that of their interaction with the game. The university students were encouraged to learn German through the IF game which was modeled to promote cultural interactions in both speech and writing. The students and teachers collaborated in the game's

design and development as well as in discovering issues that caused potential disruptions in the learning process. The IF game incorporated resources to track progress, list objectives and gameplay tips with a 3D interface that resembled the modern IF games. Furthermore, the importance of additional class debriefing for deeper understanding and reflection of the game experience and cultural differences was acknowledged as the experiment progressed to the second study.

The first study was conducted by assigning eight students in the German Language course to a control group (print-based text) and seven were allotted to the experimental group (IF game). The students were exposed to the same scenarios and vocabulary through homework tasks and assessments conducted the next day, the only difference being their learning method. Later, more data was gathered through student interviews, interrogating about their learning experiences.

The second study was essentially the same in structure as the first study with homework and in-class assignments conducted over three days. It additionally included a class lesson about train stations in Germany, using photos as a visual aid for students in order to understand their homework task better. This debriefing recognized the importance of additional debriefing sessions to aid comprehension. This had not been included in the first study.

In the case of the first study, even though the students in the print-text based learning group perceived traditional learning as more effective for learning German vocabulary, they performed less well than the IF group. On the contrary, the IF group performed better in vocabulary retention assessments, despite their apprehension towards the gameplay experience. Due to the immersive game experience, or so speculated, the IF group exerted less mental effort on homework and performed better in vocabulary retention and essay writing. However, in the second study, the results were unexpected as the Print-based group showed comparatively better results than the IF group in vocabulary retention assessments. The print based groups, although had been more confident with the additional lesson, had still not performed well on assessments. While the experimental group performed even worse, despite the interactions within thematic areas.

Moreover, at first students expressed discomfort with the gameplay, especially in the first study, finding it frustrating and challenging. Whereas, in the second study they felt more at ease with the game due to the continuous interaction as well as the additional post-game reflections. Even though, students being more comfortable with traditional print-based text learning inclined towards the old ways of language learning, the IF group found DGBL to be effective for vocabulary learning as well as understanding German culture, hence, suggesting the potential benefits of 3D gameplay learning.

With its findings, the DGBL methods show potential to change the ways of language learning more positively, making the acquisition of a second language more effective and entertaining. However, despite the better performances of the IF group, students viewed DGBL as a less valuable source of learning in comparison to the conventional means, possibly due to the apprehension of unfamiliar learning environments. Therefore, when implementing DGBL, it is imperative to take in view careful consideration when integrating DGBL into the more familiar approaches. Additionally, as per the study results, students also suggested the need for the development of quality interface, debriefing lessons and the alignment of gaming challenges with course objectives. Despite the results highlighting the potential for DGBL in

the realm of education, specifically in SLA, the research displays certain limitations that cannot be overlooked. The experiment was conducted on a small sample size and requires further studies to validate its finding in order to determine the most effective pedagogical approaches.

Although this research is an important in the field of digitalized learning yet, there are a lot of problems with how it is written. The research does not follow a good structure where the introduction serving as a summary to the rest of the article while mentioning the methodology, limitation, findings, promoting their designed game and such. The objectives are mentioned in the methodology but the methodology as includes sections where the changes done after the research was conducted are also mentioned. The authors admitted the sample size was very small and so their findings were not generalizable yet, a lot of information was also missing about the participants such as their German proficiency levels, which semester were the participants of the experimental group taken from, whether or not the participants were actively trying to improve their German language skills outside the classroom.

The findings section mentioned the delimitations before the actual findings and the data was not shared even for the quantitative tests. The findings section also included the process of how the experiment took place instead of the methodology which makes it very difficult to navigate through this research article by reading back again and again. The findings did mention that a lot of students complained about the level of difficulty in the game was far beyond their German proficiency level but any solution to that was not mentioned. Furthermore, the authors kept on mentioning how the usage and productivity of this research could be used for researches in the future but what is worth mentioning is that the discussion and significance method mentioned that DGBL method is not fit for all. There are, still, a lot of people in the world who do not either access to or lack the understanding of how the digital things work and the digital learning also requiring in-class lectures and facilitations for ease of learners.

Ali Soyoof, Barry Lee Reynolds, Rustam Shadiev & Boris Vazquez-Calvo (17 Jan 2022): A mixed-methods study of the incidental acquisition of foreign language vocabulary and healthcare knowledge through serious game play, Computer Assisted Language Learning, DOI: 10.1080/09588221.2021.2021242

The study by Soyoof et al. (2022) looks into how serious gaming can unintentionally teach people vocabulary in foreign languages and healthcare information. The background is well known and highlights how crucial it is to incorporate technology—specifically, serious games—into language learning environments. The goals and research questions are well-defined, with a dual focus on evaluating language learning and medical knowledge within the context of serious gaming.

A thorough summary of the research design is given in the methodology section. The study's robustness is increased by the use of mixed methods, which integrate qualitative and quantitative approaches. Although the participants are mentioned, the lack of information regarding their demographics and the selection criteria limits the applicability of the findings. Transparency in the research process is provided by the comprehensive descriptions of the teaching materials and assessment techniques. Nonetheless, questions concerning the

study's internal validity are raised by the lack of data regarding the length of gameplay sessions and the frequency of material exposure.

The primary findings show a positive relationship between serious gaming and the unintentional vocabulary and medical knowledge acquisition gained from foreign languages. The article provides statistical analyses, numerical data, and observed patterns; however, it is unclear how to place these findings in the context of the larger body of literature. The article briefly mentions its relevance to earlier research, but it could benefit from a deeper analysis of how the findings compare and contrast with previous findings. A results breakdown based on participant characteristics may also offer more information.

While highlighting the implications for teaching second languages, the conclusion does not fully address the limitations of the study. Although the paper recognizes the need for more research, it makes no concrete suggestions for how to strengthen the points that have been found to be weak. A more comprehensive discussion of limitations, including sample size, participant characteristics, and potential biases, should be included. Even though the study produced encouraging results, the paper would benefit from a more thorough explanation of the limitations and difficulties that were faced.

According to the study, serious gaming has the potential to advance language learning and medical knowledge. Instructors can take advantage of these results by including thoughtfully created serious games in their language curricula. It is recommended that educators exercise caution and take into account the limitations of the study when incorporating serious games into a variety of educational settings.

Using a mixed-methods design gives the study more depth and enables a thorough comprehension of the phenomenon. This method improves the validity and dependability of the results by combining quantitative and qualitative data. However, the lack of a control group in the experimental design makes it more difficult for the study to prove that serious gameplay causes the outcomes that are seen. A control group would have made it possible to compare the results more closely and more accurately attribute the intervention's effects. This also causes concerns regarding the generalizability of the results because the participants, their demographics, and the particular serious game used may not represent a diverse range of learners or contexts. Hence, the possibility of sample biases, the study's applicability to a larger context may be restricted.

It is also very admirable that serious gaming can combine the study of foreign languages with the acquisition of medical knowledge. This combination takes into account the real-world situation where professionals require both domain-specific knowledge and language proficiency. Yet, the article places a lot of emphasis on quantitative data, which could overshadow the depth of qualitative insights. A more comprehensive understanding of the intricate relationship between serious gaming, language learning, and healthcare knowledge would have been possible with a more balanced presentation of both different types of data.

The article can be strengthened by addressing potential confounding variables, recognizing limitations in the study design, and offering insights into areas where further research could enhance the methodology. At the same time, it is worth noting that this particular study is timely and relevant given the growing role that technology, particularly serious games, plays in education. The emphasis on acquiring knowledge about healthcare is especially relevant in the current global context, where health literacy is essential.

Ranalli, J. (2008). Learning English with The Sims exploiting authentic computer simulation games for L2 learning. *Computer Assisted Language Learning, 21*(5), 441-455. DOI 10.1080/09588220802447859.

In the paper "Learning English with The Sims exploiting authentic computer simulation games for L2 learning," Jim Ranalli examines the possibilities of utilizing The Sims as a tool for L2 (second language) acquisition. The introduction of the piece discusses the topic's history and highlights the value of using real and interesting materials in language instruction. The author sets the stage for additional research by posing pertinent questions, such as how computer simulation games can improve language learning.

The methodology utilizes a thorough and all-encompassing approach to examine The Sims' efficacy in second language acquisition. The study includes a precise description of the methodology used, along with information on the sample size and participants. On the other hand, the paper is silent about potential biases and participant selection criteria. While the assessment method is discussed and teaching materials are briefly mentioned, a more thorough examination of the methods used to measure proficiency levels would be beneficial. To improve replicability, the research execution process could be more thorough.

The findings show a positive relationship between L2 learning outcomes and The Sims usage. Although some pertinent numerical data is highlighted in the article, the overall argument is undermined by the absence of statistical analysis. To further enhance comprehension of the results, a more thorough examination of the observed patterns in relation to the research questions would be beneficial. Determining the results' applicability to earlier research is difficult without a careful analysis of statistical significance. To determine the strength of the observed relationships, a more thorough analysis of the data, such as one that involved correlation tests or inferential statistics, would be beneficial to the article. Although there are mentions of comparisons with earlier research, the paper lacks precise references and direct comparisons. The credibility of the article would be increased by including supporting data and addressing whether the results concur or disagree with previously published research.

The limitations of the study, including the need for additional research and possible biases in the sample chosen, are acknowledged in the article's conclusion. To address potential confounding variables and the findings' generalizability, the limitations could be expanded. Although they are mentioned in passing, the implications for teachers of second languages could be covered in greater detail. The article's usefulness would also be increased by a clearer link between the limitations of the study and how they affect real-world applications for language teachers.

Although this paper offers a novel viewpoint on language acquisition through computer simulation games, there are several issues with it, including a lack of strong empirical support, the possibility of overgeneralization, the lack of a long-term impact analysis, and the rapidly evolving field of technology. Subsequent investigations may expand on these concepts, tackling the pointed out shortcomings and offering a more thorough comprehension of the function of real-world computer simulation games in teaching second languages.

Although it is a good research, language teachers must take into account the drawbacks and potential biases of using The Sims for second language acquisition. Depending on the unique language skills being targeted and the characteristics of the learner, practical applications can

differ. Teachers ought to proceed with caution when incorporating computer simulation games and think about enhancing them with a variety of teaching techniques. Positive results about the benefits of using The Sims for learning a second language (L2) are presented in Ranalli's study. Language teachers must, however, approach the incorporation of computer simulation games, like The Sims, with a critical mindset, taking into consideration a number of inherent limitations and potential biases.

The characteristics of the sample that was used may limit the generalizability of the study's positive results. The characteristics of their own students, such as age, skill level, and cultural background, should be taken into account by educators because they have a big impact on how well The Sims work in different learning environments. What is effective for one set of students may not have the same impact on another. It is important for language teachers to carefully coordinate the use of computer simulation games with the curriculum's specific learning objectives. Teachers should also be on the lookout for any biases in the game content, as these could inadvertently reinforce stereotypes or cultural quirks that could have a negative effect on students. It becomes imperative to give learners direction and context when they interact with the game material in order to guarantee an inclusive and culturally sensitive language learning process.

Furthermore, The Sims' real-world applications in language education may vary depending on the specific language skills being taught. Further research is required to ascertain whether The Sims is equally helpful for improving speaking, listening, reading, and writing skills, even though Ranalli's research shows a positive relationship between The Sims use and general L2 proficiency. Teachers are advised to use caution and strategy when incorporating The Sims or other computer simulation games into their language teaching arsenal in light of these factors. Although these resources can offer interesting and real language experiences, they should only be used as a single part of an all-encompassing teaching approach. A well-rounded and efficient language education is ensured by incorporating a variety of conventional and cutting-edge teaching techniques alongside game-based learning.

Amin Rasti-Behbahani & Maryam Shahbazi (2022) Investigating the effectiveness of a digital game-based task on the acquisition of word knowledge, Computer Assisted Language Learning, 35:8, 1920-1945, DOI: 10.1080/09588221.2020.1846567

Acquisition of vocabulary is one of the most important essentials of any language learning and according to Krashen, “learners with big vocabularies are more proficient in a wide range of language skills than learners with smaller vocabularies.” (1989, p. 440) Conversely, becoming skilled at vocabulary is multifaceted, and may prove to be difficult and complex, owing to the intricate nature of word usage and understanding; in different scenarios and contexts. Regardless of numerous methods having been introduced, none can be coined as universal approach for building effective vocabulary. Digital Game-Based Vocabulary Learning (DGBVL), is currently being researched upon as a probable tool in a safe virtual settings (Kirriemuir, 2002). Although its effectiveness and potential is debatable, some evidence are in favor and support the benefits (Chen, Tseng, & Hsiao, 2018; Zou, Huang, & Xie, 2019), however, others are inquisitive of its efficacy (deHaan, Reed, & Kuwada, 2010; Lee, 2019). Significantly, the present research evidence tends to be more focused on the learner’s understanding of meanings of words, instead of the intricacies pertaining the

domain of word knowledge. This study is directed to fill the gap through reassessing the impact of a DGBVL on acquiring vocabulary, in view of the countless dimensions of word knowledge and provide a comprehensive take on its effects. (Schmitt & Meara, 1997; Schmitt, 1998; Webb, 2005).

124 Persian speakers from English language learning institutions in Behban, Iran, where chosen through a convenience sampling method. The participants were aged in between 11 to 13 and were at lower-intermediate English proficiency level according to Oxford placement test (2004). Out of the 56 male students and 68 female students were randomly assigned to either the control group or the experimental group, both having 62 participants each. The participants were informed of their rights and the ethics of the research before taking their and their families consent for the research. A digital computer based game called Haunted Hotel: Death sentence was used in which the player is a detective trying to solve a mystery behind his friend's murder. The games was selected exclusively from adventure genre as Pivec, Dziabenko and Schinnerl believe that "adventure games use intrinsic motivation" (2003, p. 18) An instructional manual was also used to help the users learn how follow the game instructions to complete different objectives and also minimize cognitive load, demotivation and reduce the time spent on completing different tasks. A regular vocabulary learning task (RVLT) such as fill in the blanks by choosing the correct word and modifying its word form to fit the sentence. The control group did not have to modify the word form. 40 nouns were initially selected which occur only once or twice in the first chapter of the game and then reduced to only 10 words that appeared only once and participants of both groups were unfamiliar with.

At first, the participants were at first familiarized with the game for six minutes using a different chapter from the game and then paired up (Cohen, 1987, p. 90) for completing DGBVL tasks in first chapter of the game. The pair took alternating turns to complete different mini games such as puzzles, watch different unskippable video scene in order to make the game more engaging. The students were allowed to use online dictionary to search any of the words they do not understand in the game and the session lasted for one hour. The controlled group participants were also paired up and given DGBVL tasks such as fill in the blanks in the sentences by choosing them from the word bank of twelve words given to them. This group was also allowed to use the same online dictionary as the experimental group but their session lasted for only forty minutes but the participants of both groups were exposed to the pre-selected ten words only once in their sessions. In the end, a delayed post-test was taken three weeks after the experiment session (Schmitt, 2010, p.157) for all of the participants. All the participants took the same tasks and test with time limit in the presence of the researchers to ensure smooth process. Multiple tests were administered and the students did not have the choice to look at their own previous tests and could only move on to the next test which contained 10 questioned each. The tests focused on the receptive and productive knowledge of orthography, association, word's meanings and forms for recognition and recalling.

Multiple tests such as Kolmogorov-Smirnov test, Friedman test and many other others were used to analyze the data.

DGBVL made a significant difference in the acquisition of aspects, dimensions and scopes of the word knowledge framework as the test group performed better in acquiring both

receptive and productive knowledge compared to the RVLT. The DGVBL task enhanced the group's productive recognition of form meaning while RVLT enhanced the acquisition of receptive knowledge of association. The components of word knowledge framework either support or hinder acquisition of each other (Schmitt, 1998; Schmitt & Meara, 1997). Nearly all the components positively correlated with each other except for orthography which does not associate with productive recognition knowledge of meaning. DGVBL enhances and strengthens the associations of the components.

The results of this research proved to be similar that of the previous researches; reporting the positive outcomes through DGBVL tasks. It posits that multimedia-rich tasks of this nature can enhance the acquisition of various dimensions of word knowledge, including receptive, productive, recognition, and recall knowledge of orthography, meaning, and association (Janebi Enayat & Haghighatpasand, 2019; Sundqvist, 2019). An exclusive occurrence of receptive knowledge in form-meaning recognition exceeded by of productive knowledge, stimulating recognized standards in; acquiring vocabulary and DGBVL literature both (De La Fuente, 2002; Morris et al., 1977) also makes this research unique and a valuable addition to the existing literature in the field of computer assisted language learning. Based on the transfer-appropriate processing hypothesis, the study suggests that the DGBVL task can be reflect as a prolific vocabulary acquisition task, with participants demonstrating superior performance in productive-recognition tests (Mondria & Wiersma, 2004; Webb, 2005).

The authors also speculate that the distinctive nature of DGBVL inputs, encompassing textual, pictorial, and auditory information, fosters a multidimensional understanding of target words (Webb, 2007) and the dimensions, and scopes of the word knowledge framework are developed more effectively, emphasizing distinctions between the experimental group, form-meaning and recognition knowledge were prioritized, and the control group, excelled in receptive knowledge of association. At the same time, they also mentioned that the 10 words selected for the experiment were all concrete nouns and the knowledge of just concrete nouns could not be transferred in other aspects of the language such as grammar, register, etc. Another limitation that was noticed was that in the time between the first test and subsequent next ones was short enough that the participants might have learned the new words they encountered in the previous tests thus affecting their performance in the next ones.

Conclusion

After reviewing all these articles on vocabulary acquisition via gaming for second language acquisition, it seems like a good approach that can be implemented in the coming years but not immediately. The fact is, in order to introduce a new pedagogical technique in the existing approaches to any kind of learning in general requires an in-depth understand of the new technique as well as training of the educators in order to make the maximum use of it.

The findings in the different research articles also showed that even though gaming is a good method and incorporates fun with learning, one cannot ignore the fact that the games have to be vigorously monitored and controlled in order to avoid negatives effects such as cognitive load and stress.

There are a lot of aspects such as cultural sensitivity and cognitive factors such as intrinsic

motivation at play as well which could both be positive or negative at the same time depending on how well prepared the students are. Another interesting point to be noted is that, all the researches took participants who were aged 11 or above but the older the students are, the less confident they felt about changing their teaching approach even if their ongoing instruction method was not as effective as the gaming method.

At the same time, the games utilized in all of these researches were also either very vigorously selected or in one case, specially designed for language learning and tailored specifically for some aspects of education. All kinds of games cannot be used as it also increases the risk of over-exposing the knowledge that could lead to information overload.

Another concerning factor was that among the sample taken and participants involved, none of the researches mentioned the aspects outside of the research domain, the independent variables that could lead to distortion in the results obtained. By at the same time, not a single researches findings could deny the fact that gaming is indeed a very creative and successful method of teaching being explored as it does gives better result than traditional teaching approach yet it could not work independently.

The digitalized approach to teach does not remove the importance of the teacher in the classroom rather by incorporating print-based teaching with the digitalized approach, the students can learn more because there are a lot of factors such as empathy and emotions involved with different aspects of learning that require a human interaction. The students also need constant guide and facilitator in case of any problem, all of which cannot be done if a teacher is removed. As a teacher, who has taught during COVID-19, I can say that the role of the technology in teaching cannot be denied at all. When all kinds of institutions had to lock down, technology did make it through and the learning did not stop. Although the start was a bit shaky as it required a lot of practice, learning and getting used to, the end result was worth it.

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