Game-based English Learning

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Thank you note:

This book is accepted during a world challenge season generously by **Lambert Academic Publishing** of Germany about the beginning of summer on ***July 4th 2020.*** I appreciate my mother 詹綾綢 Linda Lin Chou Jan and my father Hero Ming Shiung Lin 林民雄 to help me during my hard time being sued, first time in my life. I appreciate Professor Leon W Couch III 林可勤, a German heritage American to guide me to adapt and integrate into the post-contemporary time in Taiwan, departed and try to negotiate with China during the Covid-19 season, while numerous laws and legal issues in Taiwan are changing each day and many people felt hard to live their daily life normally. I hope this book contributed to long-distance teaching and learning, instead of face-to-face courses in the classroom during the season, which schools are closed for the disease reasons. I believe very soon, some situation can be calmed down and accepted by everybody.

English Language Learning by Computer Games

Abstract

This research was aimed at investigating the pedagogical roles of computer games (Hao et al, 2019, Chen & Hsu, 2019). It explored the impact of computer "mixed with language" (White et al, 2019) training, using simulation games, upon language acquisition and diverse daily-life knowledge. In a teacher preparation university of western Taiwan, the researchers had collected data to explore the effectiveness of

students' language learning and oral presentation improvements.

It sought noteworthy cases and persuasive qualitative and numerical data from academic performance grades, implying the computer assisted learning by games does contribute to improve learners' English language proficiencies for science and art and humanity majors in the teacher preparation university. By both (1) in-class instructions promoting games to be language learning materials by the teacher, and (2) students' applications of the video games in-class and out-class, the

project had finally resulted non-English majors' improvements in English language presentations, especially the Information Administration majors. It implied computer games should be approved to be English learning materials, because it contributes to students' language proficiencies, especially in oral presentation abilities. Under the administrators' permissions by language trainers' designed syllabi and curricula, English language learners can be allowed to apply in and out of classes as English learning tools.

Keywords: computer assisted learning; educational games; presentation abilities; qualitative research; quantitative research; computer assisted instruction

1. Introduction

Existing publications suggest computer games can motivate students (Cózar-Gutiérrez & Sáez-López, 2016; Crookall, 2007; Hao & Lee, 2019, Peterson, 2010), sponsoring to educational progress in different subjects (Hou & Li, 2013). “It was found that the gaming approach benefited the students' learning achievement and motivation.” (Hwang et

al., 2017) On the other hand, some British scholars pointed out that a research gap of evidence proving the effectiveness still exists and is awaiting an investigation (Hainey, Connolly, Stansfield, & Boyle, 2011ab).

Although lots of publications suggest simulation games can stir intrinsic motivations and contribute to educational purposes, yet there is still a research gap awaiting investigation. That is, newer field works are needed, providing more specific evidence and proving the constructive influence of simulation games upon students' knowledge learning (Hainey, Connolly, Stansfield & Boyle, 2011a). To

respond the above statement, in the field of English language learning, students' proficiencies of speaking and listening is the targeted abilities that this research aimed to investigate.

Simulation games (Mayer, 2019) can be found on-line and also in markets of the 3C (communication, computer and consumer), educational games focusing on language learning can be easily found on Facebook by language learners, but insufficient empirical studies provided data indicating how online games with English interfaces can increase language learners' English acquisition. Therefore, this prolong research of two years was

conducted in a teacher-preparation university, attempting to investigate the advantages and lesson plans by game-based learning. Elements of written information, photographs, and videos all support the educational processes involved in simulation and gaming (Crookall, 2013).

About language learning via game, Dreyer (2014) has addressed significant correlation exists between game scores and vocabulary skills post-test, thus suggesting the merits of developing game-based assessments of vocabulary learning as a curriculum design example. This research on technology associated with English language inference and vivid elements

designed for freshmen might result in better learning than traditional pedagogies, such as rote-memorisation vocabulary practices or multiple-choice drill tests. Hence, the novel and motivating game-based education are recommended to be promoted in formal colleges.

In the newer pedagogical game-based learning field, between 1996 and 2009, among 7392 papers, Hainey et al. (2011b) identified, only 172 papers were empirical and only 64 of these were considered to have an appropriate methodology. They motivate this research project on technology in education to practically utilize an ideal course design and data

analyses to respond to the literature lack mentioned, especially for the English Teaching field. Hainey et al. (2011b) has declared, more empirical researches should be conducted to understand the use of computer games in education and in entertainment. So, this empirical research related to English education had analysed five types of English oral proficiencies the researchers assigned to their students, and revealed numerous related educational themes.

In order to provide implications for game-based practice and explore school administrative policies, this research provides numerical data that suggest

English proficiency improvements and presents the perceived significance of certain themes. The projected games aims on bridging the gap between the reported theoretical works and the needed experiential reports. They provide an opportunity for online interactions and language learners to immerse in English, in a virtual and international community. They inspire students to persevere English learning to integrate into the transnational events. Compared to traditional methods, simulation games generate intrinsic motivation in inspiring, dynamic or knowledge-laden environments.

Student motivation from simulation games (Garris, Ahlers, & Driskell, 2002, White et al, 2019) can be classified into individual motivations, such as challenge, fantasy, curiosity, control, and interpersonal motivations, such as cooperation, competition, and recognition (Hainey, Connolly, Stansfield, & Boyle, 2011b). Moreover, games can promote active learning and critical thinking skills (Navarrete, 2013). Augmentation of vital cognitive, social, language, and technical skills can be assimilated and included into the content of online web pages. Students can be benefited from being exposed to concepts, such as historical tales, scientific

significance, geographic relevance, and social knowledge.

Hainey, Connolly, Stansfield, and Boyle (2011a) ever compared pre- and post-test results between experimental and control groups. The indicate that game-player participants absorb more knowledge contents than control group participants. The players engaged in role-playing games as a project manager, analyst, systems designer, or team leader in computer games, such as the Dream Home Estate Agency, the Stay Home Online DVD Rentals Company and the Perfect Pets Veterinary Clinic, the Blackwood Library and the Fair Winds Marina.

Smith, Drobisz, Park, Kim, and Smith (2013) emphasize language learners increase their vocabulary ability through game-based approaches. In English language teaching and learning field, insufficient evidence exists to prove game-based learning also increases students' English-speaking and listening proficiencies. Hence, the researchers decided to proceed this experiment.

2. Literature review

Investigating previous field workers' literatures may support the curriculum development of the instructional technology. Pioneering scholars predict the acceptance of the game-based educational technologies for English language learning, due to that the English language interface is designed by almost all games under the international trend.

Using simulations and games are two of the most effective techniques for language trainers, who allow learners to use and practice in the target language

mixed in computer games (Gaudart, 1999, White et al, 2019).

Numerous scholars promote and encourage the educational technologies. An article, “Towards a Reconceptualization of Simulation: From Representation to Reality” (Crookall, Oxford, & Saunders, 1987), states although simulation as a general category of activity can be understood as being representational of reality as opposed to being reality itself, the distinction between these two dimensions or worlds is not always clear in actual practice.

Simulation is usually seen as somehow representing some real-worldly structures, as a representation with a referent, and thus drawing its essential meaning and existence from that referent.

Under the existing globalisation trend, English is practiced as an international language. Hence, using game mixed with language learning (Fu et al, 2019, White et al, 2019) containing the simulated world, to experience the globalised ways of communication in English, can be an applicable educational methods to learn the universal language.

From historical perspectives to explore the previous literatures, early fieldworkers' literatures involved the development of small-scale simulation prototypes. (Taylor, 1990) Game-based education invites students to think in terms of models and abstracts (Crookall & Oxford, 1990).

In the 21st century, computer games are frequently associated with cognizant abilities. Gee (2003) states games are based on cognitive science, which studies human thinking and learning through laboratory research, studies of the brain, and research at actual learning sites, such as classrooms and workplaces. Another advantage is they are based on a student-

centred learning style, which eases time management issues in the classroom.

Later, Halleck (2007) says THE ITA PROBLEM not only provides an introduction to cross-cultural communication for undergraduates, but also provides a rich body of material for participants to practice receptive skills (reading—phase 1, listening—phases 2 and 3) and productive skills (speaking—phases 2 and 3, writing—phase 4). Besides, language simulations through games stimulates students' abilities in critical thinking (Kovalik & Kovalik, 2007).

Following, scholars propose the game-based instructional technologies motivate insightful language and holistically thinking and kinaesthetic activities. Schick (2008), mentions a Bullying Role-play designed by Halleck (2008) for training English-language learners, suggesting that role-play simulations constitute a particularly robust, highly complex, and multi-layered type of language socialization practice.

Moreover, Tomlinson and Masuhara (2009) suggest computer games can integrate with Total Physical Response approach of language learning by kinaesthetic activities. Enjoying a game

from a foreign country, such as the watermelon game in Japan, can provide a positive cultural experience.

In recent years, actively self-centred participators use the Internet frequently. By the rapid adoption of the World Wide Web, a huge number of user-submitted game reviews are available online as a resource for an analysis. (Zagal, Tomuro, & Shepitsen, 2011). The efficient video game learners will spend time practicing, during concentrated sessions without interruption. (Hamlen, 2012).

In Taiwan, Hou and Li (2013) have revealed appropriate challenge levels and

clearly defined game goals may increase the acceptance of the game by students. From view of educational game designs, both language contexts and logical story contents should be taken into considerations, while they are being applied as formal materials of diverse subjects or language learning. Moreover, Li and Tsai (2013) have suggested that cognitivism, constructivism, social cultural perspective and activism should be identified as game learning perspectives.

Now, game-based instructional technologies are regarded to be ideal materials that can be applied in formal courses because game-based instructional

technologies can increase the young learners' motivations and actions to learn English. Clapper (2015) indicates the role of the facilitator is reflective in nature, including the needs of their learners and their own actions that they select to facilitate learning. Koponen and Julkunen (2015) also agree with it is a reflective communication training tool.

They chose a specific communication context, created authentic client cases for sales communication training, which emphasized reflective participation and a psychologically safe learning environment, and made the experience applicable to real sales situations.

This research will fill a research gap between sufficient game-based studies and the evidence lack of significant progress in differentiated English abilities by empirical studies. It will reasonably suggest educators a flexible attitudes toward game-based language training. When formal English teachers' syllabi and curricula are proposed to the administrators and the students, appropriate education games can be included into language programs.

3. Methodology

The methodology includes IRB signing procedures to protect students' right of learning in the very beginning. During the second examinations of speeches, the students were requested to draw pictures in examination sheets to explain the targeted learnt knowledge and vocabularies focused on a certain game they selected.

Students conducted their speeches by playing demonstration with a huge screen showed in front of classroom to all classmates and a smaller computer screen to the researcher. Sounds of interactions

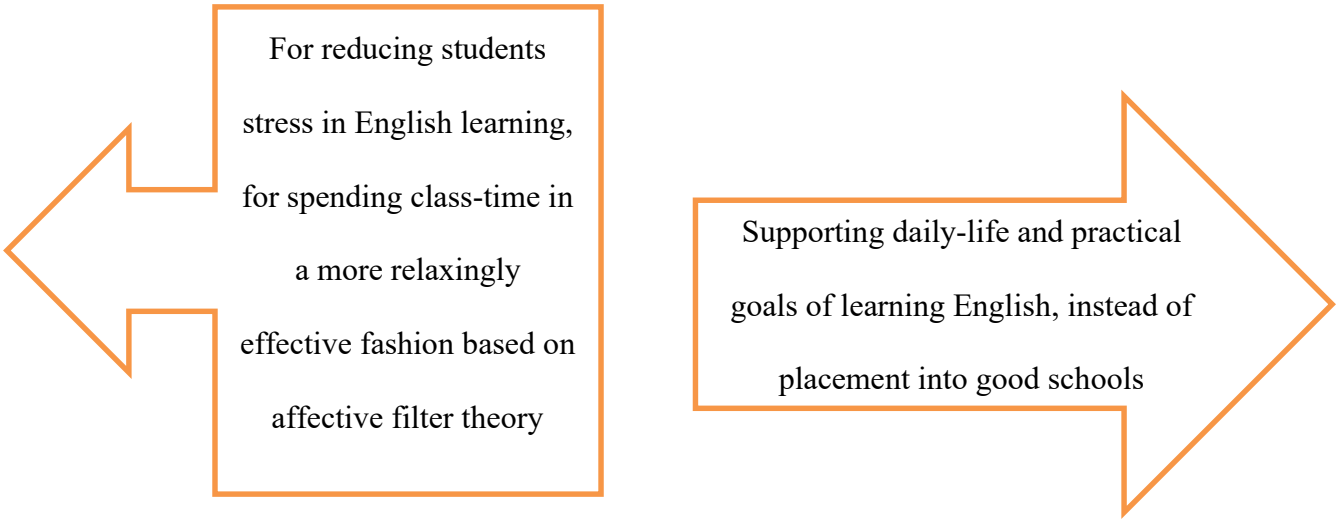
with their on-line partners were shown, from whom they dated and invited to support their performances, prior to the test time. Pictures like, pets such as dogs and cats, different devices, wheat farm and fruit trees, diverse structures of great buildings in the world, or a cabin panel of an airplane were drawn, to support the researcher's understanding, while they are playing and doing presentation.

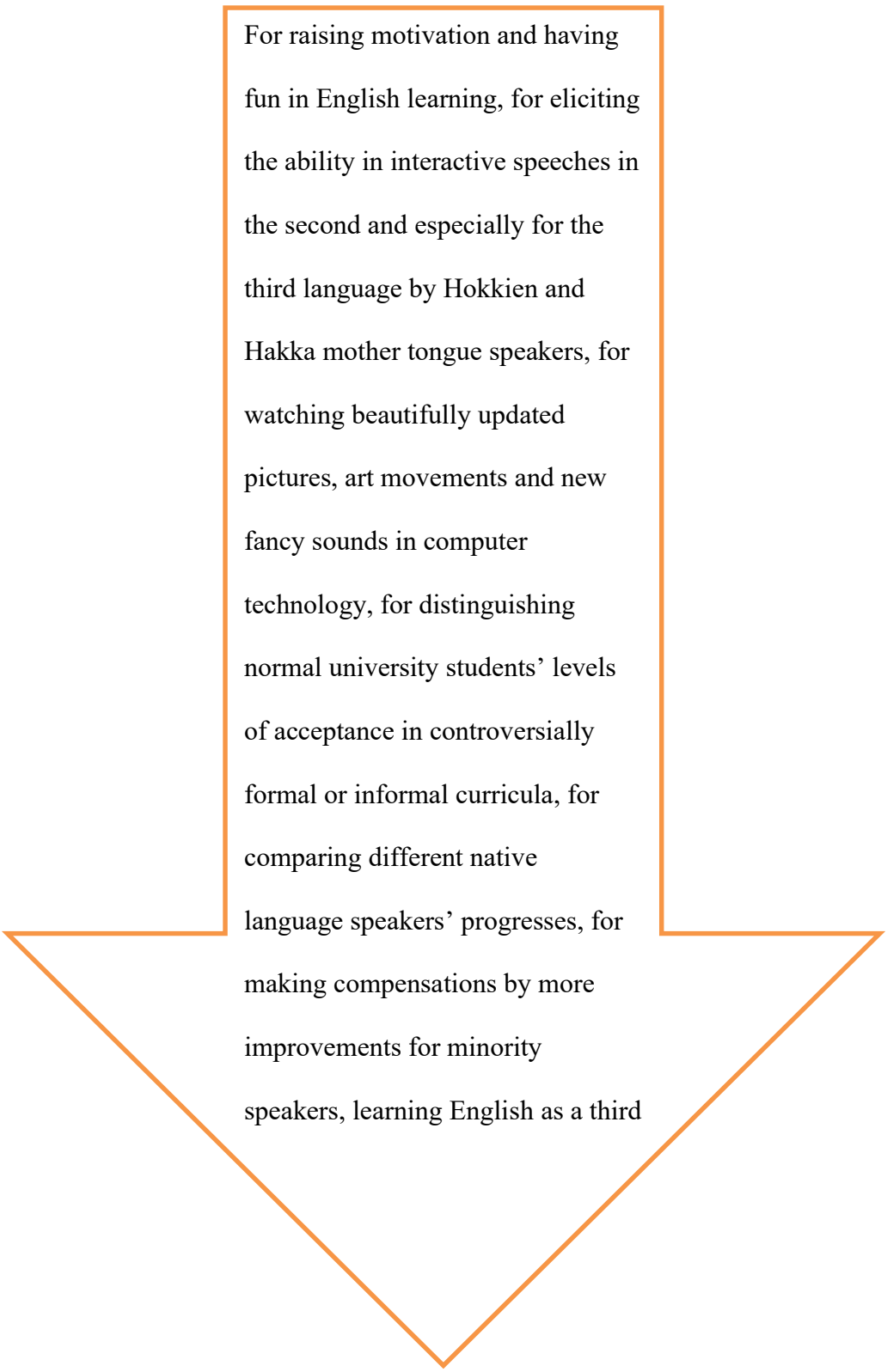
3.1 View point of the researcher and tools of data collection

Based on the researcher's own experience of English learning, it had been a series of memorizing and testing without fun. Hence, this study conducted attempt to raise motivation of students' learning in order to make the whole process more interesting. In truth, it is for avoiding students stop learning English for testing purposes after entering a top university.

Scanning model for explaining purposes of study

What are the teacher's own view points and purposes for conducting this riskily controversial game-based research?




For raising motivation and having fun in English learning, for eliciting the ability in interactive speeches in the second and especially for the third language by Hokkien and Hakka mother tongue speakers, for watching beautifully updated pictures, art movements and new fancy sounds in computer technology, for distinguishing normal university students' levels of acceptance in controversially formal or informal curricula, for comparing different native language speakers' progresses, for making compensations by more improvements for minority speakers, learning English as a third

Additionally, purposing on students' presentation ability upgrading, the researchers invited students to play games and do oral presentations for contrast the differentiated performances. The tool of test is 1. 60 minute test for three times by online TOEIC reading and listening of Toeic tests, and students' oral presentations by demonstrations of playing the game they selected to learn English. Before and after the pedagogy, the students' scores were graded by computer-based test and presentation by two different topics, about great men's biography and the game introduction, respectively.

By comparing and contrasting conventional and computer-based pedagogies, this research on technology for language learning may fill the literature gap mentioned through its results, which indicate increased improvement levels with the game-based approach. Pre- and post-training data may fulfil what Hainey, Connolly, Stansfield, and Boyle (2011ab) were searching for. By a pilot study by survey of the first year (N=15+39), students positively agreed and strongly agreed (31+51=82%) to apply game as teaching and learning material. (See Appendix A)

The participants learned conventional presentation skills, during the first semester and the game-based pedagogy during the second with the researcher. The researcher taught in the teacher preparation college for two years for this project. Conventional presentation skills included strategies suggested by the Princeton University website.

During the second semester, the participants were provided the following concept map and directed to prepare presentations. (**Figure. 1**) In fall and spring semesters of two years for four sessions, the teacher as well as the author had invited students to sign their consent form based

on IRB regulation and then start to learn by game-based projects. Each week, students spent twenty minutes learning. In the first semester, they do presentation by topics of a great man, they selected.

During the second semester, numerous games such as GUESSING SONG KING and CITY VILLE were exposed to students by the teacher herself, firstly. The games were demonstrated by the teacher in the first three weeks for twenty minutes in each class, by singing and speaking in English.

For example, the QUESSING SONG KING was first of all played by the teacher

as well as the author in front of all students using classroom instruments. English lyrics were read, songs were sung and their titles were guessed. The next week, she exhibited her own achievements in CITY VILLE and direct students to read the instructions. PET SHOP SOCIETY was also displayed by the researcher in the third week, in which the teacher found her partner players appearing in the game, who were her students. This proves her students accepted the game-based curriculum quite quickly.

In the following weeks, the games were played by the students. The class listened to the native speakers in the games

of FARM VILLE, FLIGHT SIMULATOR, PLANTS AND ZOMBIES or CAFÉ WORLD for translations, grammatical explanations, and lexical interpretations, demonstrating by students in pair or groups for twenty minutes.

The teacher suggested that the students should play the recommended games and choose one on their own to become proficient at and present to their classmates as final examination. Students were requested to list vocabularies and grammatical structures, they learned in the final examination sheets.

Also, they should articulate to the class in the presentation, the more native-like

pronunciations discovered from the games. Although the instructor reminded them not to play by paying with credit cards; however, one or two (less than 1%) students' great achievements, being impressed by the instructor, seemed to be established by extra time or money.

All students were graded according to the speech strategies learned and their performances, during the presentations. The presented games mostly provided holistic language learning functions, including Ages of Empires II, III, Clouds & Sheep, Crazy Farm, Cut the Rope, Draw Something, Final Fantasy, F1 2011, Jungle Adventure, Limbo, Little Friend - Games

for Girls, League of Legends (LOL), Monster Hunter 3, NBA 2K12, PopKart, Ragnarok Online, Puzzle Bubble, Asleep Walking Game, Sudoku, Taikyo Master, Tap Sonic, Tetris Battle, Wonderland Online, Woodened Path 2 and so on.

3.1 Research setting and reliability

As shown at **Figure 1**, the research proceeded in subsequent fashion. At the end of each semester, the participants gave presentations. In the first semester, the presentations were on the topic of a great man's biography (e.g., Einstein), and in the second semester, the students presented on an educational game (e.g., CITY VILLE).

Two researchers graded their performances to increase inter-rater reliability. Each student was given three to five minutes for the presentation, and their grades served as their final exam scores. At the end of the year, individual face-to-face interviews were conducted in the classrooms and in the professor's office to triangulate results.

The interviews are after the surveys with open-ended questions to avoid guiding students' own opinions and encourage critical thinking. We employed same methods for the third class of Information Administration majors, during the second year.

Figure 1. Procedures of research methods

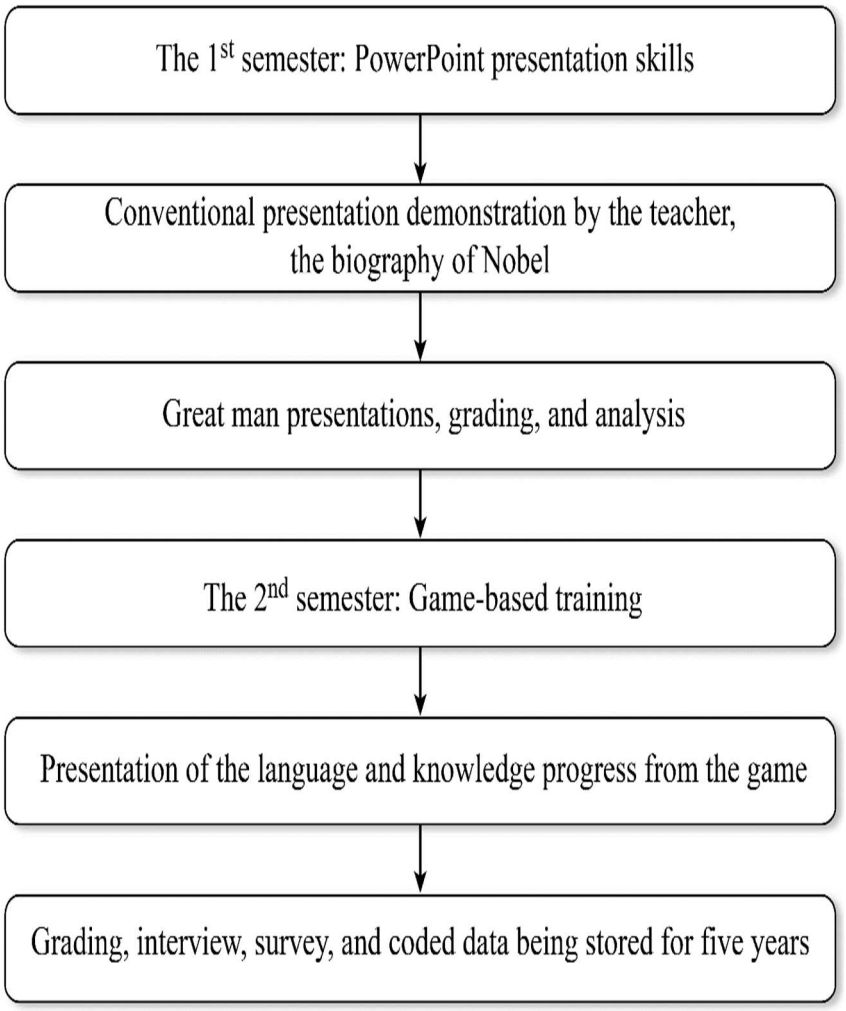
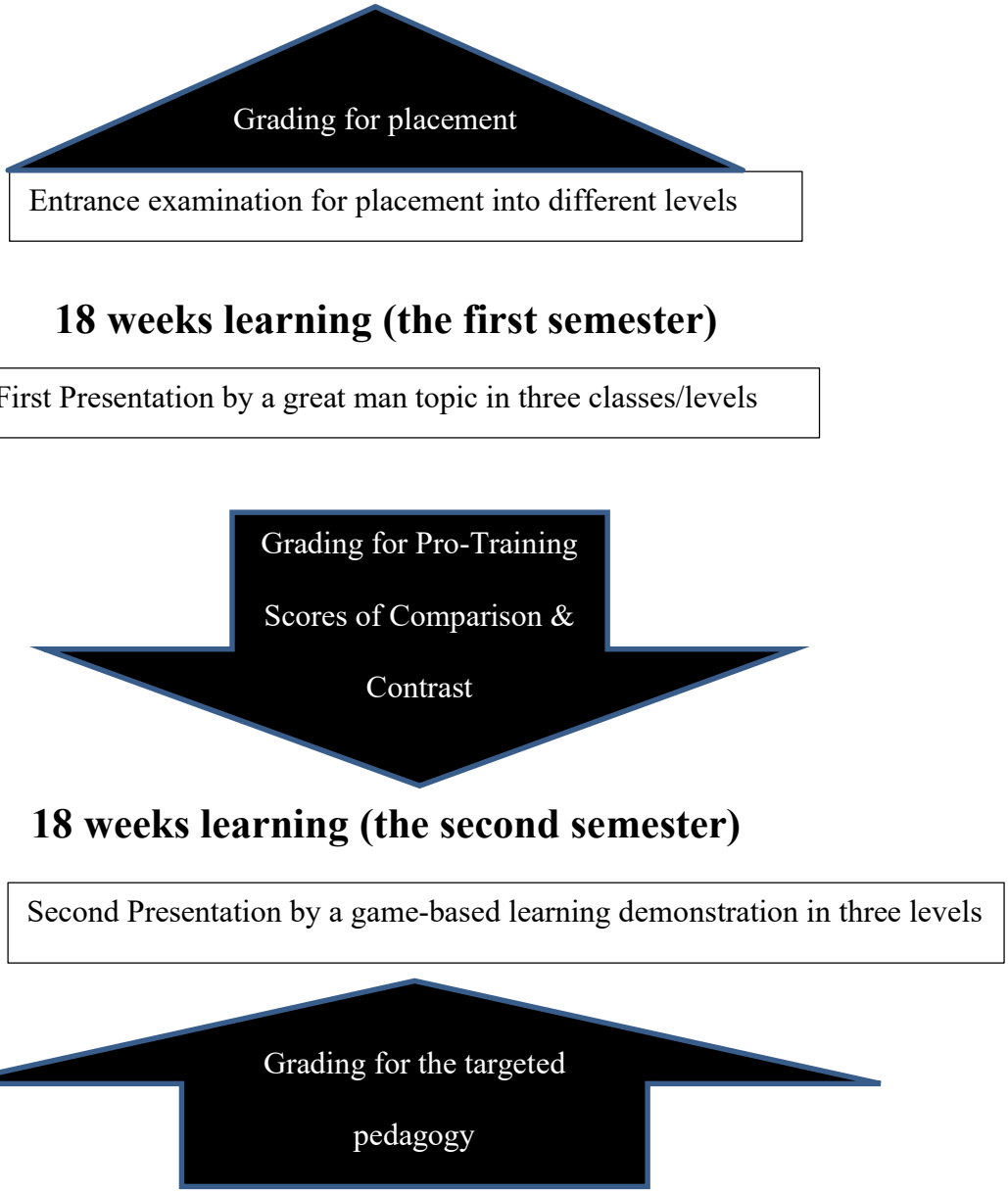
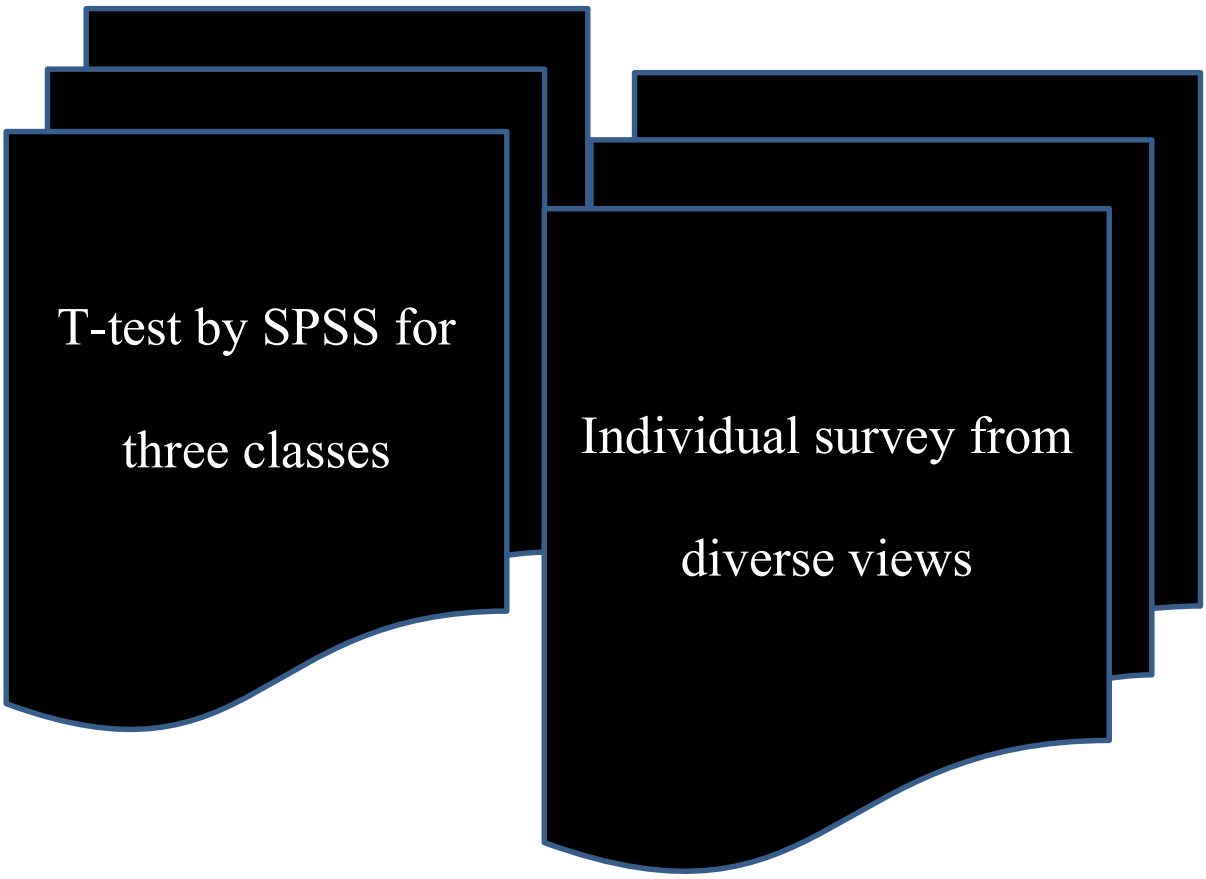


Figure 1.1 Research framework by three figures

1. Three examinations for calculating the grades and levels in three class:



2. Two measurements by numbers of scores and individual survey



New discovering of advantage of game-based pedagogy

3.2 R

(1) If playing a game (James & Mayer, 2019) can actually make English language learners' English knowledge improved, then what specific language speaking proficiencies can be enhanced after training? If the grades before and after training by computer games are significant enough to fill the gaps of the evidence lacks?

(2) What are proved to be the most important themes the language learner had perceived? What aspects of the games are regarded to be beneficial to the participants

in terms of knowledge, comprehension, and language learning?

3.3 Instruments and data analyses

The purpose of this study is to clarify the advantage the language learners can obtain, by their differentiated abilities after learning by games. First, we applied BOX-PLOT figures and T-TESTS in SPSS to analyse the five specific proficiencies before and after training. The researchers had analysed the data, according to the statistical mean comparison and box plots.

3.3 Participants

The participants comprised of college freshmen students taking the required six credit hours of courses. Their entrance exam scores were used to assign the participants into three levels: lower level, intermediate level and advanced English language learners. The thirty-nine intermediate-level language student participants were from the Physics Department, and another fifteen participants were at the advanced level and from other departments.

In the second year, the fifty-nine participants were lower-level language students from the Information Administration Department. All students in the course were trained to be senior high school teachers and included female (N=49: 43%) and male students (N=64: 57%). The students' native languages included Mandarin (33%), Hoklo (Hokkien) (34%), Hakka (21%), and some aboriginal tribe languages (12%).

3.4 Evaluation criteria for five specific improvements

Focusing on a curriculum design associated with the improvement of presentation skills, the five specific abilities related to the grade criteria assigned to participants were I) demonstrating comprehension and familiarity with the instructed target; II) eliciting audience interaction; III) clear pronunciation; IV) persuading and convincing (credibility); and V) vivid and engaging content.

The scores for two tests of three classes were analysed. The students' presentations

improved over time, becoming more fluent and dynamic and using less time.

3.6 Assumptions

(1) Students appreciate games for language learning purposes. The students reported their achievements to their instructors

(2) Students' English proficiency improved significantly after game training.

3.7 Limitations

(1) The students at the Teacher Preparation University have an access to more educational computer equipment than students at other institutions. Therefore, their optimistic opinions may not represent all students in Taiwan.

(2) The Information Administration majors, in particular, communicated their satisfaction due to their interest in Computer Science.

(3) The medium of instruction for the

great man topic for doing presentation are students' searching based on Wikipedia and biography or historical books in English students can find in libraries, so the significant improvement from game-based learning could/ should also be from the first semester learning progress. The third limitation is the improvement ranges between three tests, including joint examination, and two final exams of two speeches.

(4) This limitation can be resorted to that the administrators did not provide the researcher the learners' original English scores when entering

university as freshmen, so the ranges of two time differently significant improvements cannot be compared and contrasted. In other words, two semester progresses cannot be discovered clearly without grades of the entrance examinations.

4. Results

The improvements in students' speaking abilities at both levels were significant. Using a scale of 100, at the **advanced level**, the students' scores for the presentation skills and game-based pedagogies were 83.1 and 92.4, respectively. (**Table 1 & 2**) The

intermediate level students' averages for the presentation skills and game-based pedagogies were 75.2 and 83.8, respectively. (**Table 3 & 4**) The general improvement ranges were significant: 9.2 (**Table 2**) for the advanced level; and 8.6 (**Table 4**) for the intermediate level, indicating the advanced participants benefited by 0.66 more.

The standard deviations for both levels, particularly for the advanced level, were smaller after training, signifying that the differences in ability among individuals are insignificant and the pedagogies appear to be effective and fair

for all. Standard deviation means the difference among different individuals. There are less gap abilities after training in advanced level.

This is very significant, which means the education has an effect to reduce the score difference and make everybody to have the similar ability in one class of many students, who had very different gaps in scores. It implied the game-based language learning should be applied in schools that students' abilities are labelled to have gaps.

Additionally, in the second year, the mean scores for the third class of lower-level students in the Information Administration Department were 63.2 and 73.5 (**Table 5 & Table 6**) for the presentation skills and game-based pedagogies, respectively. These students displayed more significant results (10.3 **in Table 6**), than the participants in the first year (9.2 and 8.6 as shown in **Table 1, 2, 3 & 4**).

The significant differentiated results match the previous assumptions as the students in majors related to Computer Science showed more motivation as participants. This finding contributes to a

reason why the lower-level students showed higher levels of improvement than the students at the other levels.

4.1 T-test by Means comparisons of pre- and post-training scores according to five criteria, about the advanced level to superior level

The progress sequences for the advanced class varied from the higher-intermediate-level class (**Table 2**) to advanced and superior levels. The variances from more significantly different levels to non-significant effects were: 1) 2.5 for clearer pronunciation from 16.7333 to 19.2367 (III); 2) 2.4 for eliciting

audience interaction (II); 3) 2.2 for vivid and engaging content (V); 4) 1.67 for demonstrating comprehension and familiarity (I); and 5) 0.47 for persuading and convincing (IV).

The reasons for the significantly distinguished improvement could be that the subject matter provided by the interactive online environment differs from that of more serious high school textbooks. The improvements between the different levels can be found visually by statistical analysis of IBM SPSS Viewer, after treatments by in **Figure 2, and Table 1 and 2**.

Table 1. Pre-training

Advanced	N=	Mean
Pre-game I	15	16.6667
Pre-game II	15	16.4000
Pre-game III	15	16.7333
Pre-game IV	15	16.4667
Pre-game V	15	16.8667
83.1334		

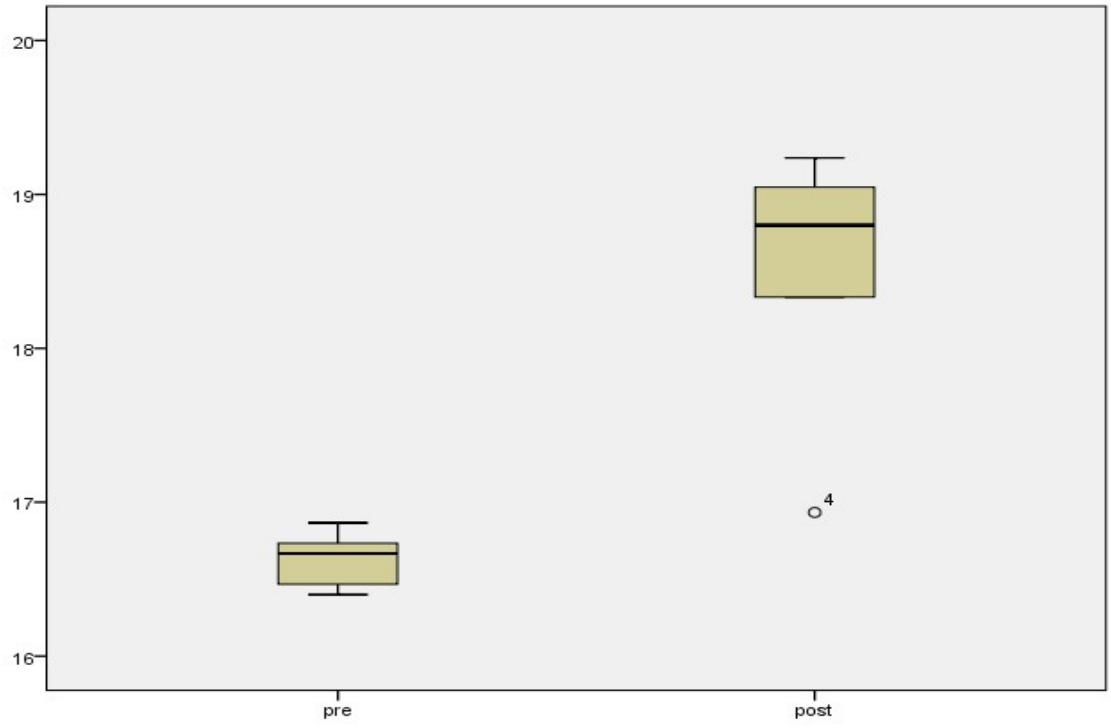
Table 2. Post-training

Advanced	N=	Mean
Post-game I	15	18.3333
Post-game II	15	18.8000
Post-game III	15	19.2367
Post-game IV	15	16.9333
Post-game V	15	19.0467
92.35		

Improvement:

I: 1.67 II: 2.4 III: 2.5 IV: 0.47 . V: 2.2 (9.2 total)

Figure 2. T-test by two box plots, Pre and post score of 5 ability averages in advance class (SPSS chart)



4.2 From intermediate-level class to higher-intermediate level

The order of improvement for the five criteria in the intermediate-level class (**Table 4**) was 1) 2.44 for eliciting audience interaction (II); 2) 1.95 for clear pronunciation (III); 3) 1.9 for demonstrating comprehension and familiarity (I); 4) 1.85 for vivid and engaging content (V); and 5) 0.44 for persuading and convincing (IV).

Comparatively, students' averages increased by 8.6; the small dispersion of values indicates that games are an effective

and efficient pedagogy for all members. The improvements from Intermediate to higher-Intermediate can be found after treatments. From the updated IBM SPSS Viewer to see the micro differences clearer in here.

Table 3. Pre-training

Intermediate	N=	Mean
Pre-game I	39	15.1272
Pre-game II	39	14.6657
Pre-game III	39	14.2031
Pre-game IV	39	15.1252
Pre-game V	39	16.1212
75.2424		

Table 4. Post-training

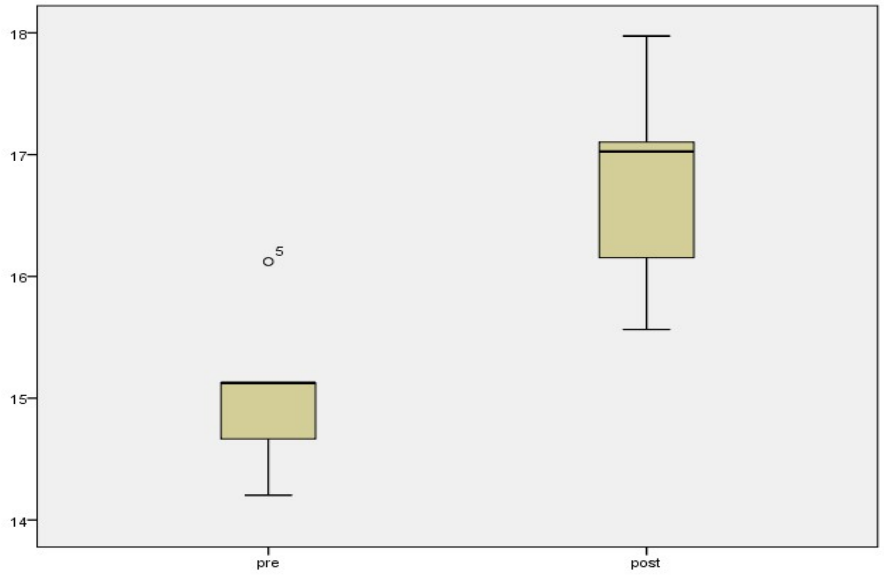
Intermediate	N=	Mean
Post-game I	39	17.0256
Post-game II	39	17.1026
Post-game III	39	16.1538
Post-game IV	39	15.5641
Post-game V	39	17.9744
83.8205		

Improvement

II: 2.44 III: 1.95

IV: 0.44 V: 1.85 (8.6 total)

Figure 3. T-test by two box plots, Pre and post score of 5 ability averages in intermediate class



4.3 The lower-level class

The order of improvement (**Table 6**) was 1) demonstrating comprehension and familiarity (I); 2) eliciting audience interaction (II); 3) persuading and convincing (IV); 4) vivid and engaging

content (V); and 5) clear pronunciation (III). The lower-level students' improvements were differently more significant from the previous two classes, which demonstrates their high interest levels focused more on technology than English.

It can be observed that their interest in Computer Science meanwhile increased their desire for language learning and improvements after training. The improvements from lower-level to intermediate level (approximately from 63 points to 74 points), can be found after treatments by IBM SPSS Viewer in **Figure 4, Table 5 and 6**.

Table 5. Pre-training

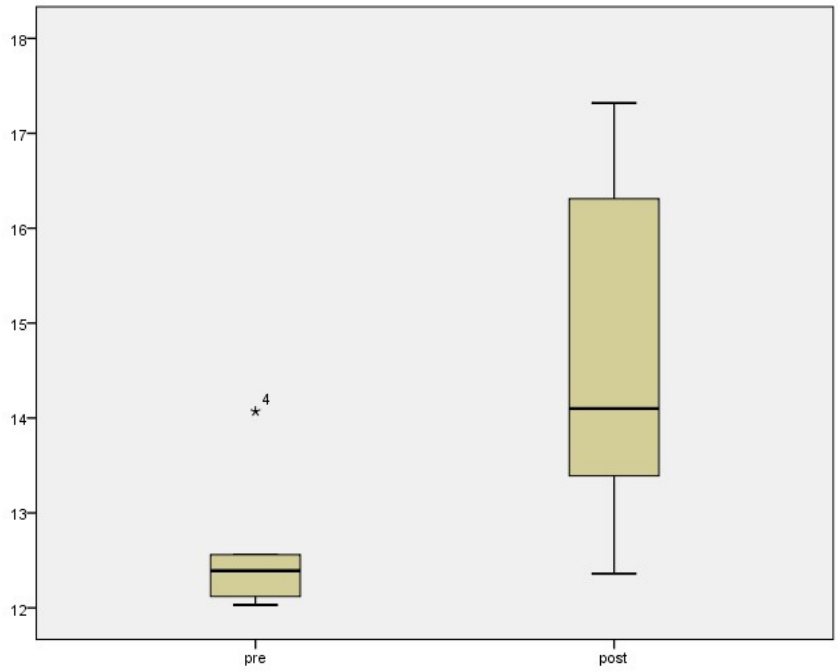
	N=	Mean
Pre-game I	59	12.56
Pre-game II	59	12.12
Pre-game III	59	12.03
Pre-game IV	59	14.07
Pre-game V	59	12.39
	63.17	

Table 6. Post-training

	N=	Mean
Post-game I	59	16.31
Post-game II	59	14.10
Post-game III	59	12.36
Post-game IV	59	17.32
Post-game V	59	13.39
	73.48	

Improvement: I: 3.75, II: 1.98, III: 0.33, IV: 3.25, V: 1.00 (10.3 total)

Figure 4. T-test by two box plots, Pre and post score of 5 ability averages in lower-level class (SPSS)



Discussions, comparison for three classes: The result indicates that there was an increase from pre- to post-training in the skills of eliciting audience interaction (II) and clear pronunciation (III) for the advanced and intermediate levels during the first year. For the interactive skills of persuading, convincing, and standard

articulation, all participants improved, although the degree of progress varied.

Partly due to their interest in professional fields, the Information Administration majors naturally improved more in the areas of comprehension, convincing and persuading, and in eliciting audience attention. The students' speech pronunciations and contents became dynamic and non-preaching like, accommodating the new generations' atmosphere.

4.4 Advanced students' skills versus intermediate-level students'

Web-based simulated virtual worlds provide for real time text chat and voice-based communications within theme-based simulated world that are user created. It supports collaborative dialogue and generates the production of modified target language output (Peterson, 2010, White et al, 2019).

Due to native speakers' standard articulations, the advanced students were able to achieve native-like pronunciations as they absorbed more linguistic knowledge and skills, such as articulations rather than focusing on functions and design methods. The intermediate-level students engaged the audience more and

elicited more interactions and questions from their classmates. By demonstrating how to interact with foreign partner players, they delivered thought provoking and inspiring presentations.

4.5 Information administration majors

Information Administration majors improved in (I) comprehension and familiarity with the instructed target plus (IV) persuading and convincing, which matched the researchers' assumptions. Designing functions for educational purposes is the professional pursuit of these students.

Due to their heightened motivation, the students improved dramatically by more than ten points in their presentation skills, thus raising their basic skill level to intermediate. The reason is their level in the placement (aptitude) exam was formerly in a basic level before training and they belonged to the group who is interested in computer science.

They have more motivation to admit this game-based syllabus related to their future careers. This study suggested they can be included into school curricula.

4.6 For the qualitative data using an open ended questionnaire, the

outcome of the data by form of themes, using thematic analysis

While debriefing was not conducted following the games, the instructor face-to-face interviewed her students with the question: “How do you like your selected game?” She record their answers by a camera and then transcribed to code her students’ handwritings and oral descriptions in front of the camera.

After thematic analysis, the positive result can be triangulated again, according to four concluded themes: 1) learning vocabulary, 2) learning financial management, 3) practicing listening,

pronunciation and reading, and 4) social interaction.

First, the most frequent responses related to vocabulary items and were practical or related to daily life. In the ZIP & TERRY introduced by Li and Topolewski (2002), suggest there are four modes for each of the environments of Living Room, Kitchen, and Yard Sale. In PLANTS VS. ZOMBIES, Nancy learned terms related to plants and vegetables. In RESTAURANT CITY, Tom learned that a “skunk” is a small black and white North American animal.

In PET SOCIETY, John learned vocabulary related to plants, animals, and kitchen utensils. Second, the responses indicated that the games enhanced financial management concepts, such as how to manage a farm, restaurant, or city.

Second, Annie said that while playing COUNTRY STORY on Facebook, she paid attention to the pets or plants that might get stolen. Standard processes learned for building assets could include being aware of regular harvest time or picking up stones and branches to build stables, coops, and ranches. Emily reported that HAPPY FARM taught her how to make a living, afford seed for

planting, and sell agricultural foodstuffs. Ryan felt CITY VILLE taught him the concepts of business management by implicitly communicating the commercial concepts of supply and production chain management. For example, the chain is presented in the game as goods→ people → money → farms→ goods.

Third, the participants mentioned that the games motivated them to learn listening, pronunciation, and reading skills. Warner noted that FLIGHT SIMULATOR is a stimulant for travelling by listening native-speaking English; it felt like flying a real aircraft built during World War II. In an immerse environment, he was

motivated to listen to oral guidance from the tower and monitor all dashboard instruments in the cockpit.

The subtitles and standard pronunciations of Native-English speakers led him to understand instructions regarding piloting towers. The student had suggested that Simutrans, an open-source business strategy game allowing players to operate a transportation service company in different seasons and nations, taught her about the integrated services of freight, power transmission, and communication.

An excellent English reading speed was required to increase scores. Her motivation to succeed at modifying the "paks" led her to learn how to read the content effectively.

Fourth, regarding social interaction, Peter mentioned that in MAPLE STORY on Facebook he could interact and cooperate with online adventurers through the chat function. Meskill (1990) also ever mentioned computers can be perceived as mediating tools that enhance immerse environment. Furthermore, they provide opportunities to acquire second language forms in an authentic context (Schwienhorst, 2002).

4.7 Individual Survey and the triangulated manners

Table 7 indicates the triangulated manner from individual survey response, in unison, the participants respectively tend to agree with the improvements in listening and reading skills. Based on their independent responses to same questionnaires, students training to be teachers separately supported interactive games as applicable pedagogies for formally educational purposes. From the questionnaire items numbered #1, #3, #11, #18, and #19, five areas have been identified as significant factors in language learning: 1) listening (93%), 2) reading, (92%), 3) relaxing (95%), 4) deepening

understanding of Western world concepts (94%), and 5) memorisation (93%).

Based on two TOEIC scores of the two speech before and after training, the T-test shows the significant difference in students' grades. The speech scores were given by two native-speakers for establishing inter-rater reliability, grading for the two final examinations as well as the oral presentation of the great man and the game introduction, respectively. Each student's performance showed significant improvement as displayed in T-test graphs, and the following table seven also displays the survey triangulated outcome using percentiles.

4.8 Outcome indicated improvement by significant different levels in diverse proficiencies

The outcome shows 1. the 93% students listen to English clearly, 2. 91% learn interaction behaviour in English, 3. 92 % are motivated 4. 87% learn interactive replying writing 5. 83% learn new vocabularies 6. 76% learn how to structure a sentence 7. 71% learn grammar 8. 72 learn logic and feel smarter 9. 73% understand more about financial management 10. 85% feel confidence in on-line society 11. 95% feel relaxing and learn English better 12. 84% learn how to

take care of pets 13. 78% learn to protect themselves and attack the others 14. 72% learn English with native-speakers 15. 88% learn to concentrate

16. 83% learn to deal with challenges in life 17. 91% imagination and creation ability increased 18. 94% more concept about western world 19. Memorization ability established 20. 82% learn to interact and cooperate in English

Table 7. Survey triangulations for participants' aptitude (N=113)

Question Item	*Total*	*1. Agree*	*2. Strongly Agree*	*3.Disagree*
#1 I learned how to listen to English more clearly.	**93 %**	**71 /63%**	**34/30%**	**8**
#2 I learned how to interact with the characters in the games by speaking English.	91%	67/59 %	36/32%	10
#3 I am motivated to read the content. My reading ability has improved.	**92 %**	**69/ 61%**	**35/31%**	**10**
#4 I learned how to write through interaction with people online playing the same games.	87%	56/50 %	42/37%	15
#5 I learned many new English words.	83%	67/59 %	27/24%	19
#6 I learned how to structure a sentence.	76%	55/49 %	31/27%	27

#7 The game I am playing contributes to my understanding English grammar.	71%	44/39 %	36/3 2%	33
#8 The game I am playing improves my logic. The game stimulates my brain cells.	72%	42/37 %	40/3 5%	31
#9 My understanding of financial management is strengthened by playing the game.	73%	52/46 %	31/2 7%	30
#10 My social confidence is enhanced by interacting with players online.	85%	66/58 %	31/2 7%	17
#11 I played the game as a stress release and learned as a by-product.	**95 %**	**46/41 %**	**61/5 4%**	**6**
#12 I learned how to care for my pet or my friends by playing the game.	84%	59/52 %	36/3 2%	18
#13 I learned how to protect myself as well as attack others by playing a war game.	78%	46/41 %	42/3 7%	25
#14 I met native speaking players online who helped me make progress in English.	72%	51/45 %	31/2 7%	31

#15 I was motivated to concentrate on learning English.	88%	63/56 %	36/32%	14
#16 I learned how to face the truth and address challenges in real life.	83%	61/54 %	33/29%	19
#17 My ability to imagine and create has improved.	91%	54/48 %	49/43%	10
#18 My understanding of Western world concepts has deepened.	**94 %**	**64/57 %**	**42/37%**	**7**
#19 My ability to memorize has improved.	**93 %**	**57/50 %**	**49/43%**	**7**
#20 I learned to cooperate with online players who were helping me interact in English.	82%	46/41 %	46/41%	21

4.9 Present topics for ongoing researchers

In this study for future teachers, most students use computers of schools to learn and have fun. However, practically applying iPad-based mobile learning to teach inside and outside of classroom (Li & Wang, 2019) should be further researched, due to UK no more resolve the conveniently portable problems. Indeed, it is more useful than PC or laptop, particularly for engineers' problem-based issues. The field workers should support the convenience subject that the indoor devices cannot do.

Also, Tan (2015) suggests English e-learning in the virtual classroom are more useful for adults. The dynamic learning environment should be welcomed by learners elder than 18 years old. Tan and Hsu (2017) mentioned reliability, assurance, tangibles, empathy, and responsiveness were major five elements that can be taken into consideration in computer-based investigation.

They are crucial indicators for perceived usefulness and perceived ease of use by the users, as well as employees who work in Taiwanese electronics

corporations and take English e-learning educational training courses in their current researches.

In Taiwan, long lasting software survived for a long time with expensive prices is the dictionary Dr. eyes, AMC and Ivy English TOEIC that the researcher as well as the author suggests to apply in a combined way. It can help test takers to do preparation tasks, and they are also major database of numerous important examinations, such as criteria of graduation or official tests. Whoever needs concurrent translation for examination preparation should try to use them.

Tan (2019) emphasizes especially for “Business English”, learners’ attitudes tend to prefer the e-tutoring websites. Indeed, some newly designed system for English Evaluation and Teaching Devices, such as PZB and TAM Models are applicable (Tan & Hsu, 2019) can be purchased for students by school, due to they can break the limitation of space and time, and do exercise independently. Also, the grading methods can be added into one of the fair criteria.

What’s more, teachers can experience aesthetic enjoyment during teaching (Fan & Tan, 2019), so that developing a system for English evaluation and teaching devices can benefit users from

perspectives of diverse field worker solidity, including subjects of arts, computer science, music, education, painting. For “English self-learning, especially for teacher’s grading” computer-based device through internet must be applied (Tan & Hsu, 2017).

5. Conclusion

To summarize, by double checking the grading sheets, the different in the improved proficiencies between the different natives languages speakers are in the sequences of 1. Hakka/Canton (5 points), 2, Hoklo/Hokkien (3 points) and

the last mother tongue in official language Mandarin/China (1.4 points).

This order actually implicates the open access to native-likeness in the English can excite and motivate minority Hakka speakers, immigrant from Canton, China, who does not speak majority (Hoklo speakers from Hokkien) and the official language (Mandarin from Mainland China) as their mother tongues, merely starting to learn Mandarin as a second language from six years old (in G1 of elementary school).

The vividly relaxing English pedagogy might reduce stressed obsessions of must speaking first language, Mandarin in formal classrooms from elementary school in Taiwan in a fun way. In truth, whoever speak in their mother tongue beside Mandarin will be punished by one NTD dollar during time of Martial Law. Minority pupils tend to feel harder in studying new language from G1.

In contrast, the on-line convenience provided by English games, had saved lots of time and money for those speakers does not speak Mandarin as their mother tongue, so might need to learn the third language, English by traveling overseas to find

authentic native-speakers to interact and speak/listen in English. In other words, the good outcome shows different natives languages from Mandarin mother tongue speakers feel more relax (the most by Hakka speaker, 3.6 times than the official Mandarin speakers), gaining more progress from game-based self-learning by PC, laptop or cell phone.

The outcomes revealed that advanced learners could make progress (**Figure 5 below**), although none of them are from major related to computer science. Moreover, the Information Administration majors naturally make the largest progress, due to their interests and majors. Physics

students of intermediate made the least difference pre and post trainings, may be due to their lower motivation of computer games and language while comparing with the two groups mentioned.

According to their responses to the survey (**Table 7**), all students tended to enjoy their game sessions. Thus, simulations and games contribute to language development for three classes. The findings address the research gap identified, and the results tend to endorse the appropriateness of games to be used in formal curriculum design by the evidences collected. The researchers' experiences applying games to language improvements

are convincing and these tools are useful from the perspective of language learning. Based on four English language proficiencies, teachers can recommend that students practice certain games based on their levels and proficiency needs.

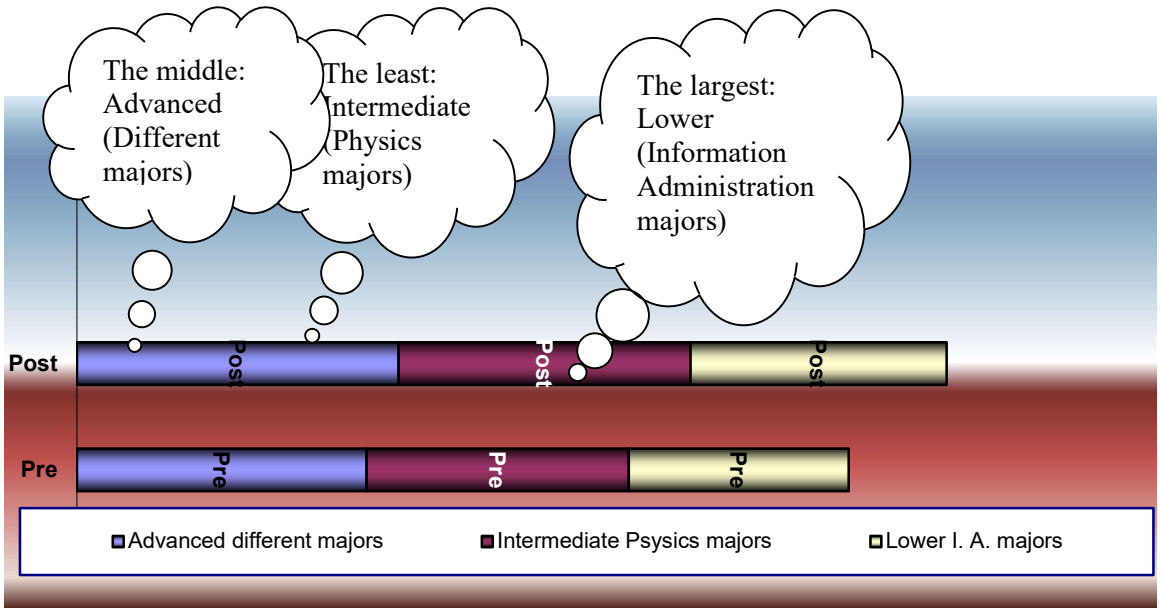


Figure 5. Progress comparison and contrast by significant different degrees

A bridge between parents, students and school advisors should be built to communicate the effects of games on language improvement at the early experimental stages. How precisely can the proficiency differences of games be recognized? How can an instructor serve as a consultant assisting the students to achieve higher proficiency levels? What particular evidence of English improvement should students show to obtain permission to play games from administrators with conservative attitudes?

Using games (Chen et al, 2019) as formal instruments of language learning is a constant debate, especially in developing

Asian areas such as Taiwan. This project succeeded because the students at Teacher Preparation University had access to sufficient computer equipment and a game-based learning programme with several interesting games. Students accepted online game learning, and their proficiencies of English, particularly related to presentation skills, have significantly improved. These findings indicate that students in Taiwan are motivated to improve their language skills through game-based learning much more than they could imagine after graduating from high school.

Therefore, it is suggested that English teachers, particularly those non-native speaking local professors, apply the above pedagogy to have a greater impact on language learning in students' adulthood. Using this method, students can increase their motivation to study the English language through "gamifying the classroom" (Farber, 2017; Niemann & Karagiorgas, 2017).

In sum, playing games, especially for those with higher emotional intelligence students (Yang, et al, 2019) is an excellent way to continue teaching English to adult students; without the attentiveness and enthusiasm for learning achieved using

games, some students might experience a delay in their progress of English language learning. Finally, the two authors thank the editors and the reviewers' supports by fulfilling their publication needs.

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Appendix. Pilot Study (N=15+39)

According to your perceptions, answer following question as associated with playing on-line computer games and language learning. Please mark: 0 for strongly disagree, 1. For disagree, 2 for agree, and 3 for strongly agree.

1. ( ) I can make progress in language learning through computer games.
2. ( ) It is good suggestion I should play games like pet society or guessing songs on Facebook
3. ( ) My motivation of learning can be stimulated by computer games.
4. ( ) The interesting games make me feel relaxing in language learning and I feel

it established native- speaking environments for me learn English.

5. ( ) I have learned new vocabularies from on-line computer games.
6. ( ) Some grammatical structures can be learned through on-line computer games.
7. ( ) The educational value in computer games is quiet high from my learning experiences.
8. ( ) My listening ability can be raised through playing games like guessing songs on Facebook.
9. ( ) Computer games are fun and beneficial for language learning.
10. ( ) Playing computer games can be included in the formal English classes

since it really works for education and language acquisition.

11. ( ) Playing games improved my ability to form winning strategies.
12. ( ) On-line games improve my ability to form winning strategies.
13. ( ) I enjoy demonstrating and instructing how to play a game for classmates and English teacher.
14. ( ) Playing games for one hour each day for learning is appropriate.
15. ( ) My knowledge of language can be better prepared from practicing on computer games.
16. ( ) I am able to use school's computer and play games with ear phone in library.

17. ( ) Playing games from one hour each day for learning is appropriate.
18. ( ) My knowledge of language can be better prepared from practicing on computer games.
19. ( ) It is easy to filter away some meaningless games involving violence, sex or gambling.
20. ( ) It will be better if my English teacher can name some computer games for me to play. She has mentioned pet society and guessing songs on Facebook, which are beneficial and valuable for my language learning.