The Design of Video games in the Implementation of Malay Language Learning Among Foreign Students in an Institution of Higher Learning

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ABSTRACT

This study aims at reviewing the curriculum design by including video games in the implementation of the Malay language course at an Institute of Higher Learning. The objective of this study is to obtain expert opinion on the expected manner of implementation of video games in learning the Malay language. The Fuzzy Delphi technique (FDM) is used to obtain the consensus among 30 selected experts from various fields and backgrounds using an instrument specifically designed for the purpose. The instrument consists of six sub items. The findings show that experts reached a consensus and agreed that the curriculum design based video games could be tailored to the learning of the Malay language among foreign students (defuzzified value: 0.680). Overall, the experts had consensus and strongly agreed that video games have potential in implementing Malay language learning among foreign students at a university. The impact from the expert consensus was that a decision was made for a new framework for curriculum design based on the potential of video games as a medium of instruction for scaffolding learning of Malay language among foreign students at a selected university. Thus, this study suggests the implementation of new education policies among stakeholders particularly at the Department of Higher Education and Ministry of Education (MOE) to highlight the possibility of using video games as a teaching tool for all universities nationwide. The Curriculum Development Centre at the Centre for Language and other faculties in all universities should view the development of this technology to enable application of a more interesting, interactive and motivating language learning process as a medium of learning the Malay language among foreign students.

Keywords:

INTRODUCTION

Curriculum design today plays a significant role in national development and human development. In fact, this discipline is also integrated in a variety of fields with wide ranging educational needs. In the 21st century, the future curriculum is seen as one of the requirements for designing, planning, implementing and evaluating a policy or education policy. This is described by Saedah Siraj (2008) as the curriculum of the future is to design or plan the future education program of mankind.

This study focuses on the elements of video game technology appropriate for implementing the curriculum in learning the Malay language among foreign students. Determining elements important for consensus among experts comprising university curriculum specialists, ICT specialists and language teachers concerned with futuristic study would help to identify elements required in video games for teaching Malay

language to foreign students. Further, the framework to design a new curriculum is seen as a plan to change the method of learning the Malay language to make it more dynamic, interactive and effective.

Background of Study

Rapid technology development has brought about a new paradigm in education. Before this, the world of education has gone through the Web 1.0 technology development phase of the internet. Then the second phase of technology development has seen emergence of web 2.0 technologies, namely *social web* involving social networking sites such as blogs, *Wikis, Podcasts, YouTube, Facebook* and *Twitter* being created for business and e-learning.

At this time, the virtual world known as web 3.0 enables communities worldwide to interact through social computing simulations that affect business, education, social sciences, science and technology. Among the technologies involved in the virtual world are video games and interactive social networking (Messinger et al., 2009). Virtual worlds are being developed and applied in the education system in the west. Video games are being adapted with the sophistication of the semantic web and avatars. Similarly, the hardware technology such as 3D simulations, augmented reality, virtual depth-sensing cameras, human-constructed semantic standards, and broadband, wireless, sensor and m-learning provide a variety of video games of different genres, for pleasure or education.

In the 21st century, the role of the Malay language has changed in context from being the official and national language to being a language of knowledge as the language is studied as a foreign language in all Malaysian Institutions of Higher Learning, Private Higher Education Institutions (HEIs) and overseas in countries such as China, Russia, United Kingdom, and Uzbekistan. Awang Sariyan (2006) views the Malay language teaching program for foreign language speakers as fulfilling the needs arising from the use of the Malay language as the language is learnt in various study centers worldwide. Bahasa Melayu has its own position in the development of the world's major languages so that there is indeed a need to investigate its development from the perspective of foreigners.

The Malay language curriculum taught in Higher Education Institutions (HEIs) has been reviewed to cater to the large number of foreign students in the country every year. The Malay language in the context of teaching and learning in higher education, is regarded as a foreign language. This is because the Malay language in higher education has been introduced as a compulsory subject to foreign or international students studing in HEIs (Fai'zah Abd. Manan, Mohamad Amin Embi, & Zamri Mahamod, 2010).

Implementation of the Malay language learning as a Foreign Language (BMSBA) started in Malaysia between 1995 and 1996. Since then, changes have occurred in the education system. This change was done to elevate the Malay language as the medium of knowledge as has previously been gazetted in the Education Act 1961 (Fa'izah Abd. Manan, Zamri Mahamod, & Mohamed Amin Embi, 2009).

In general, this study aims at investigating the design of video games in the Malay language curriculum in universities. The objective of the study is to obtain expert opinion on the expected manner of implementation of video games in learning the Malay language for foreign students at a university.

Statement of the Problem

Rusdi Abdullah (2001) stated that the number of foreign students who choose Malaysia as a destination for study at public and private higher education institutions (HEI) is increasing. Thus, the regularization of the education system through the Education Amendment Act 1995 showed that Malay is to be compulsory for foreign students studying in these institutions. The Act was amended to provide exposure to foreign students to the fundamental aspects of the Malay language, such as sound, spelling, basic grammar, and sociolinguistic aspects in order to carry out a conversation, read and comprehend simple material, and to write in the language. However, the syllabus for the course Bahasa Melayu Sebagai Bahasa Antarabangsa (BMSBA) in universities is compiled by the Language faculty at each university. Furthermore, the implementation of teaching BMSBA offered is different in each HEI (Fa'izah Abd. Manan, Zamri Mahamod & Mohamed Amin Embi, 2009).

Although the implementation of the Malay language teaching to foreign students was introduced in the 1990s, very few studies have been done on learning Malay language among foreign students in Malaysia.

There have been some studies on language learning strategies for Malay language learning among foreign students (Fa'izah Abd. Manan, Zamri Mahamod & Mohamed Amin Embi, 2009; Fai'zah Abd. Manan, Mohamad Amin Embi, & Zamri Mahamod, 2010; Yong, Siti Saniah Abu Bakar, Chan, & Vijayaletchumi, 2010; Siti Saniah Abu Bakar & Sharala Subramaniam, 2012), and error analysis and common mistakes among foreign students (Siti Baidura Kasiran, & Nurul Jamilah Rosly, 2011; Yong & Vijayaletchumi, 2012).

Review of video games in the context of language learning has been done by Walsh (2010), Pelin Turgut Yildiz and Margin (2009), Muhammet Demirbilek, Ebru Yilmaz, and Suzan Tamer (2010), Ranalli (2008); Piirainen and Tainio (2009), and Laleh Aghlara and Nasrin Tamjid Hadidi (2011). These studies focus on two main areas, namely the type of video games and the effectiveness of video games for language learning. Among the types of games discussed are Massively Multiplayer Online Role Playing Games (MMORPGs), The Sims, 3D Multi-User Virtual World, and SHAIEX (Adaptive Hypermedia System). The effectiveness of video games in language learning has been noted especially in learning English as a second language or foreign language.

Reviews on learning the Malay language among foreign students who use technology have been undertaken by Siti Plus Azit (2005) on implementation of multimedia elements in Malay language learning and Anuradha (2008) regarding the design of the Malay language learning portal for foreign students at the University of Malaya. However, few empirical studies have focused on the potential of video games in implementing Malay language learning for foreign students in local universities. However, there has been a study on the potential of video games in the curriculum of the future which focused on the Delphi method (Fuziah Rosman, Zul Fikri Mohd Munir Zamir, Saedah Siraj, & Norlidah Alias, 2012). Another study conducted by Fuziah Rosman, Norlidah Alias, Saedah Siraj, Husaina Banu Kenayathullah, Zakaria Abd Razak and Ghazali Darussalam (2013) used meta-analysis of many studies to investigate the potential of video games in the Malay language vocabulary learning for international students in Malaysia. Therefore, this research will anticipate the implementation of video games in learning the Malay language for foreign students at a university.

Review of Literature

The potential of video game use in education is frequently debated by experts and video game design curriculum specialists in the West (Moreno et al., 2008; Papastergiou, 2009; Prensky, 2001).

Papastergiou (2009) noted that some researchers predict the learning environment will be more fun and effective with the application of video games as compared to traditional learning methods. Oblinger (2004) in Papastergiou (2009) explains that several factors change the environment for better learning through video games: a) games can be *multi-sensory,* active, and extraordinary experience, using problem-based learning; b) provide and add experience while using existing knowledge; c) provide feedback quickly through hypothesis-testing and enable students to learn by action; d) provide opportunities for students to do self-assessment by scoring marks and at different levels of achievement as well; e) improving the environment and social relations between players or students.

Some researchers touched on the role of video games. Apperley (2010) argues that cybertext form a complex interplay of actions which are allowed in video games. According to him, students are able to form a broader social context through video games. Students who act as players will have the opportunity to interact with others to share their knowledge and experience to achieve victory in the game. According to Dickey (2007) MMORPGs improve intrinsic motivation among students. This is also supported by Peterson (2010) who agreed that MMORPGs increased motivation and fun learning through the game-based video interaction.

In studying the effectiveness of educational video game design, some areas deserve further investigation. The value of education and fun in learning using video games need to be balanced. For effective teaching and learning, sound teaching techniques to achieve learning objectives are required (Moreno, Burgos, Martinez, Sierra, & Fernandez, 2008). Among these are: 1) multimedia approach with regard to the content of presentation; 2) using existing video games in the market or industry in education as well; 3) existing video games that have been developed are balanced between education and fun in learning.

In addition, the general game design is based on a pedagogical approach and focuses on some

important features such as adjustments in real time, in accordance with student needs, assessment and grading in the game as well as integration with online education (Moreno et al., 2008).

In this study, theoretical frameworks used are the Hunkins curriculum model and the theory of Social Constructivism. The discussion will begin with the Hunkins curriculum model followed by Social Constructivism theory. Hunkins (1980) in Ornstein and Hunkins (2004) outlines the seven phases of decision-making include: a) conceptualize the curriculum and approve it; b) diagnosis; c) the selection of content; d) selection of experience; e) implementation; f) evaluation, and g) retention. The Hunkins curriculum model is used to design a futuristic curriculum in determining the appropriate selection of video game elements and implementation of the curriculum in learning the Malay language among foreign students at the university.

Social constructivism is a theory derived from Piaget's theory of cognitive development and theoretical development of the Zone of Proximal Development (ZPD) introduced by Vygotsky (Mok, 2013). ZPD refers to the performance and abilities of students in problem-solving beyond oneself and achieving growth at a potential higher level (Figure 1). In the context of this study, Social Constructivism theory is used in this aspect of the role of video games as a medium of learning or scaffolding in implementing Malay language learning for foreign students at the university. This theory suggests that the process of learning the Malay language through video games can improve the performance of individual students whether assisted by a teacher or friend who is intelligent and motivated to succeed according to their level and ability.

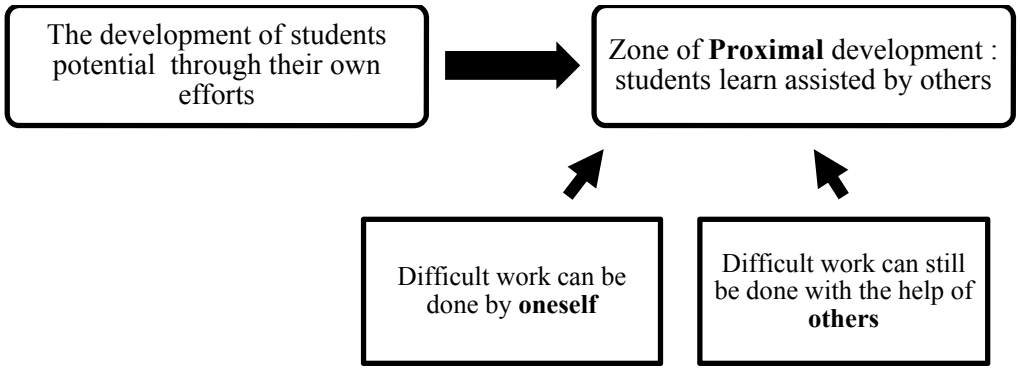

Figure 1. **Vygotsky's Zone of Proximal Development.**

METHODOLOGY OF STUDY

This study uses the Fuzzy Delphi approach introduced by Murray, Pipino, and Gigch (1985) and reviewed by Kaufman and Gupta (1988). FDM uses the combination of fuzzy set numbering or fuzzy set theory, applied in the traditional Delphi technique. This technique is not new as it has been introduced in future studies as an effective and fast measurement technique to get consensus among experts without going through many cycles in the study of innovative futuristic applications (Mohd. Shotaro Mohd. Jamil, Zaharah Hussin, Nurul Rabihah Mat Noh, Ahmad Arifin Sapar, & Norlidah Alias, 2013).

There are two main things in FDM; the *Triangular Fuzzy Number* and defuzzified Process*. Triangular Fuzzy Number* involves 3 points (m_1, m_2, m_3) of the minimum, most reasonable value and maximum value. Figure 2 shows the three values.

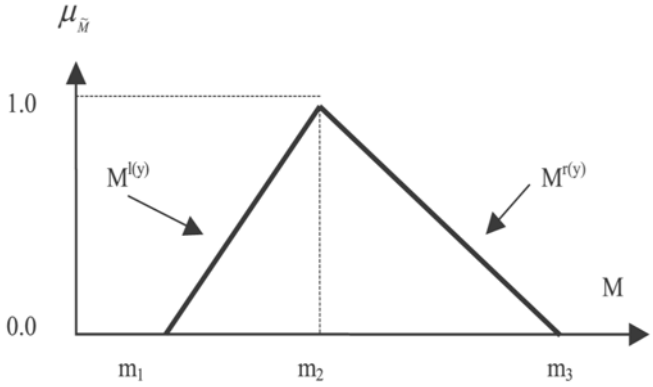

Figure 2. **The three means in Fuzzy Delphi technique.**

Figure 2 shows the *graph of the triangles mean against the triangles*

Defuzzication can also be used to determine the position *(ranking)* for each variable or item and sub variables or sub items. There are three formulas that can be applied to determine the position of:

i. $A_{max} = 1/3 * (a_1 + a_m + a_2)$

ii. $A_{max} = 1/4 * (a_1 + 2a_m + a_2)$

iii. $A_{max} = 1/6 * (a_1 + 4a_m + a_2)$

Steps to constructing a FDM (Table 1).

Table 1 Steps to make FDM

Step	Explanation
1	Determining the experts involved Number of specialists in FDM is; 10-15 experts (Adler & Ziglo, 1996) 10-50 specialists (Jones & Twiss, 1978)
2	Determine the linguistic scale, based on triangular fuzzy number
3	All data are tabled to obtain the mean (m_1, m_2, m_3)
4	Determine the distance between two fuzzy numbers to determine the threshold, *d* Provided the condition: if $d \leq 0.2$, meaning all experts reached a consensus. Otherwise, a second round is done
5	Determine the group's agreement (group consensus) The percentage of group agreement must exceed 75%, if not the second round should be done Refer to the linguistic scale table
6	Aggregates determine Fuzzy Evaluation by adding all fuzzy numbers
7	The Defuzzification process

This study will use purposive sampling. Noraini Idris (2010) stated the purpose of sampling involves consideration of individual judgment to select a sample that is based on the knowledge of the researchers and purpose specific to the research. Researchers can use their knowledge of a problem or make a decision.

Next, a list of 30 experts in an expert panel was selected in this study as shown in Table 2:

Table 2 Criteria for Selection of an Expert Panel

Expert	Criteria	Number
Lecturers / teachers	Curriculum	1
Lecturers / teachers	Language education	12
Lecturers / teachers	Information and Communications Technology (ICT)	5
Lecturers / teachers	Instructional technology	1
Lecturers / teachers	Linguistics / Literature Studies	10
Lecturers / teachers	Literature and Translation	3

The process of collecting data in this study was conducted using Fuzzy Delphi approach. Among the processes involved is an interview for the Delphi technique. The questionnaires were analyzed by using

fuzzy number. A 5-point scale was used to obtain consent or group consensus among experts (Norlidah Alias, Saedah Siraj, & Mohd Nazri Abdul Rahman, 2013) to determine the expected potential of video games in implementing Malay language learning for foreign students. To facilitate the experts in answering the questionnaire, researchers have put the scale of 1 to 5 to replace the *Fuzzy number* as shown in Table 3 of the following 5-point linguistic scale.

Table 3 Five-point Linguistic Scale

Linguistic Scale (Linguistic variable)	
Strongly Disagree	(0.00, 0.10, 0.20)
Disagree	(0.10, 0.20, 0.40)
Simple agree	(0.20, 0.40, 0.60)
Agree	(0.40, 0.60, 0.80)
Strongly Agree	(0.60, 0.80, 1.00)

FINDINGS

Analysis of the data is in accordance with *Fuzzy Delphi* approach through steps 3 through 7 will answer the research questions stated.

To see the degree of agreement among the experts, the findings of all the items have been analyzed to determine the *Fuzzy* distance between two numbers to determine the threshold*, d* as follows:

$$d\left(\tilde{m},\tilde{n}\right)=\sqrt{\frac{1}{3}\left[(m_1-n_1)^2+(m_2-n_2)^2+(m_3-n_3)^2\right]}.$$

It is supported by Chu and Hwang (2008); Murry and Hammons (1995) in Nurul Rabihah Mat Noh, Siti Hajar Abd Razak, Norlidah Alias, Saedah Siraj, Shotaro Mohd Hussin Mohd Jamil and Zaharah (2013) which states that in order to analyze the data, the distance between two *fuzzy* numbers is calculated by measuring the average deviation value.

In this study, the first condition has been complied with as the threshold is less than 0.2 for most sub items. In addition, the second condition has been observed as the consensus of the expert group which is 77.8% exceeds the minimum 75%. This shows a high degree of agreement among experts. Therefore, the second round of the *fuzzy Delphi* is not required as the data has complied with both the requirements.

Analysis showed the expectation of implementation of video games in the implementation of the Malay language to foreign students in universities. In this construct, there are six sub-items under discussion (Table 4).

Table 4 Expectations for the Implementation of Video Games In Malay Language Lesson for Foreign Students in Universities

Item / No.	The Expectations of implementation of video games / Item	Fuzzy evaluation	*Defuzzified*	Rank
1	Curriculum design based on video games should be changed to suit the Malay language learning among foreign students.	(14.2, 20.2,26.2,)	0.680	1
2	Traditional learning theories such as *behaviorism* are no longer suitable for the use of video games in learning the Malay language among foreign students.	(13.6,19.6,25.6)	0653	4
3	The Malay language syllabus can attract more foreign students when video games are used in the learning process.	(14.3,20.2,26.2)	0.673	2
4	Teacher or lecturer should apply video games for learning the Malay language among foreign students.	(14,20.2,26)	0.669	3
5	The implementation of video games online through *e-Learning* platforms like *Moodle* or *Virtual Learning Environment* (VLE) is important for more effective and dynamic learning of Malay language among foreign students	(13.2,19.4,25.2)	0.642	5
6	The type of evaluation used video games for learning the Malay language is *online.*	(13.2,19.2,25.2)	0.640	6

The score and rank of each sub item according to the experts' agreement are shown in Table 4. Based on Table 4, the majority of experts agree with sub item 1 with the *defuzzified value* 0.680. This shows the curriculum based on video games should be designed for Malay language learning among foreign students. Hence, sub item 1 ranks the highest in the list and deserves priority among experts based on collective agreement. This is followed by sub-item 3 (with *defuzzified* value 0.673) in second place, which shows that the Malay language syllabus should attract more foreign students when video games are used in the learning process.

DISCUSSION

Discussion of the findings involved answering the following research question: "What is the expected manner of implementation of video games in implementing Malay language learning for foreign students at the university, according to expert opinion?"

Analysis showed that the majority of experts agree with item 1 with the *defuzzified* value of 0.680. This shows the design of a curriculum based video games should be changed to suit the Malay language learning for foreign students. This finding is reinforced by Fuziah Rosman, Zul Fikri Zamir, Saedah Siraj, and Norlidah Alias (2012) which states that all curriculum design should be changed in accordance with future needs. This

makes the sub item 1 ranked first score in the priority list of experts based on a collective agreement. This is followed by sub-item 3 (with *defuzzified* value 0.673) in position 2, which shows the Malay language syllabus to attract more foreign students to the performance of video games in the learning process.

Curriculum design is a very important component in implementing the curriculum. It is also stated by Fuziah Rosman, Zul Fikri Zamir, Saedah Siraj, and Norlidah Alias (2012) most expert reviews given state positive impact of video games in the curriculum primarily as a learning tool. It is also emphasized by Shelton and Scoresby (2011) who stated that the study video game design education seeks to enhance students' motivation in the English language subject. These elements lend accordance with the planning and implementation of policies as a catalyst and driving force to boost the effectiveness of the learning of the Malay language to foreign students in higher education institutions. Therefore, design of curriculum for learning the Malay language among foreign students needs to changed according to the current context of evolving technology, interactive and dynamic video games.

Selection of elements on item 4 viewed in Malay language syllabus for foreign students become more attractive with the implementation of video games in the learning process that supports the implementation of curriculum design strength. Furthermore, the review of learning activities and assessment methods in the framework of the Malay language courses for foreign students *(Course Outline* LM 1030, 2011) will become more attractive through the application of video games in the future. It is supported by Moreno et al. (2008) which states that the general design of the game is based on a pedagogical approach also focuses on some important features such as: adjustments in real time, in accordance with the needs of students, assessment and grading in the game as well as integration with online education.

6 Implications and Recommendations

This study combines two theories of curriculum, the Hunkins (1980) model and the theory of Social Constructivism by Vygotsky. The resulting impact of decisions through expert consensus curriculum model Hunkins (1980) show a new framework for curriculum design based on the potential of video games as a medium of instruction or *scaffolding* in teaching Malay language to foreign students in universities can be implemented in the future. The Hunkins curriculum model and the theory of social constructivism (Vygotsky) is combined in a futuristic study for the potential of video games in the implementation of the Malay language learning among foreign students at a university (Figure 2).

Model Curriculum Hunkins (1980) Theory of constructivism SOCIAL (ZPD)

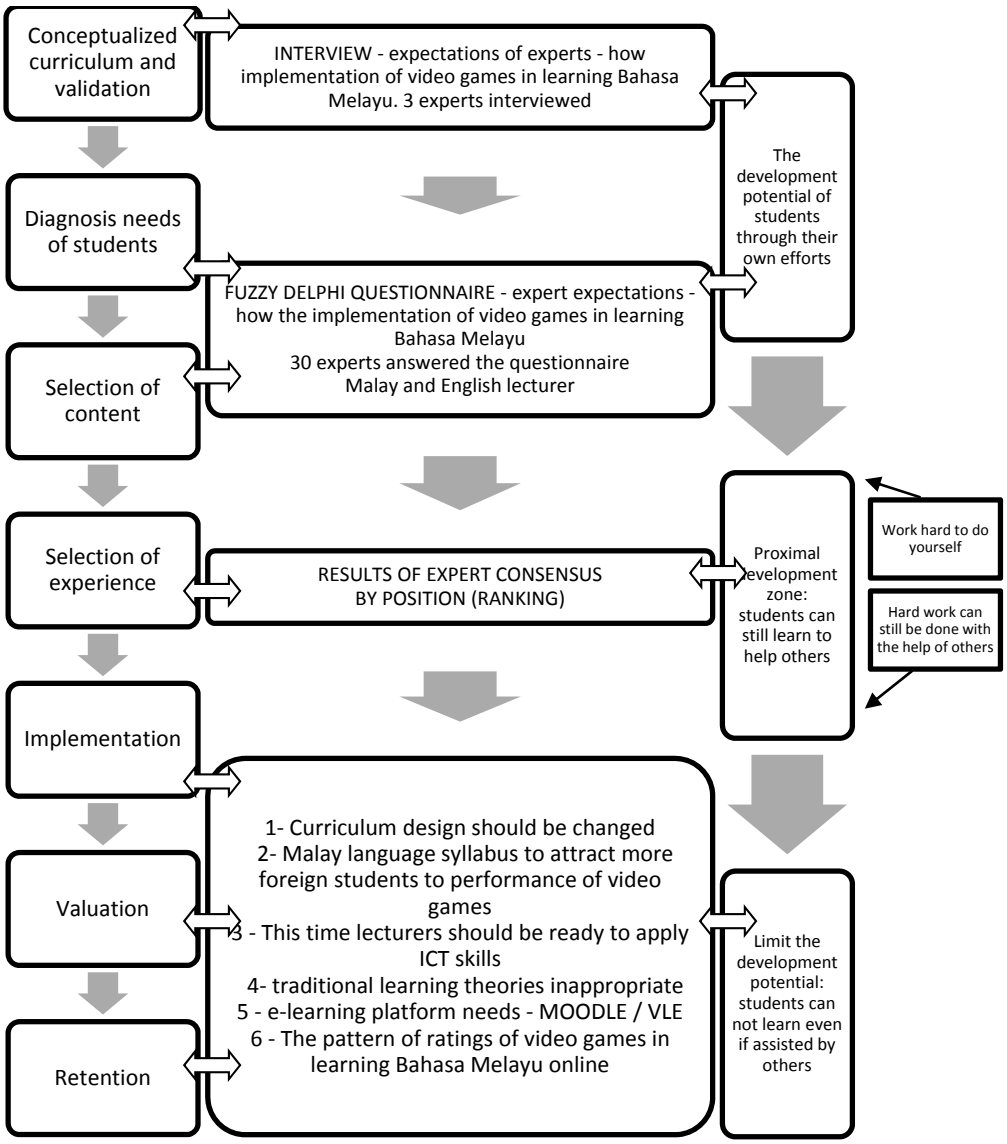

Figure 2 The Hunkins curriculum model and the theory of social constructivism (Vygotsky) in a futuristic study of a video game design curriculum in the implementation of Malay language learning in universities.

This paper proposes the implementation of new education policies to stakeholders particularly the Department of Higher Education in the Ministry of Education (MOE) to highlight the general policy or education policy that uses video game technology as a teaching aid tool for all universities nationwide. Curriculum designers at language centers and language faculties should view this study as a significant study on the potential of video games that need to be studied more in depth to adapt this technology into the teaching and learning of the Malay language. The potential of video games as *scaffolding* through the theory of social constructivism can help students to some degree given the potential for improved performance of language learning in the zone of proximal development (ZPD). Video game has potential for development and is compatible with the requirements of the language curriculum as it can enable the *scaffolding* process to better prepare students towards learning independently and always being motivated when learning the Malay language as a foreign language.

In the discussion of the findings it has been described that curriculum design is a very important component in curriculum implementation. It is also stated by Fuziah Rosman, Zul Fikri Mohd Munir Zamir,

Saedah Siraj, and Norlidah Alias (2012) that most expert reviews given state the positive impact of video games on the curriculum primarily as a learning tool. It is also emphasized by Shelton and Scoresby (2011) who stated that the study of video game design in education enhances students' motivation in the subject English Language. Selection of experts on these elements is consistent with the planning and implementation of policies as a catalyst and driving force to boost the effectiveness of Malay language learning among foreign students in higher education institutions.

7 Conclusion

The findings show that among the 6 sub items analyzed, the majority of experts agree with item 1 (*defuzzified value* 0.680). This shows the design of a curriculum based on video games could be reviewed for Malay language learning among foreign students. Selection of experts on these elements is consistent with the planning and implementation of policies as a catalyst and driving force to boost the effectiveness of Malay language learning among foreign students in higher education institutions. The consensus of experts in selecting the video game elements to prove that some potential video game elements in the implementation of the Malay language learning for foreign students at a university with a master agreement between 0.60 and 0.80. This means the experts are at the stage of approval between "agree" and "strongly agree".

This study examined the potential of video games as a medium for scaffolding in implementing Malay language learning for foreign students at a university using *Fuzzy Delphi* method (FDM). As for recommendations for future studies, researchers can use the *Fuzzy Delphi* on a broader sample to cover all the major universities in Malaysia.

For future studies, it is proposed that an instructional model for using video games for teaching the Malay language among foreign students be designed using techniques such as *Interpretive Structural Modeling* (ISM). In addition, researchers can develop and implement instructional modules incorporating video games in Malay language for foreign students using a design and development research (DDR) approach.

Studies in designing futuristic curriculum using video games should be continued, especially in bringing changes in the curriculum in the next 5 to 10 years. A prototype for a video game design should also be investigated on whether video games in language learning can be utilized by adapting existing video games as proposed by Moreno (2008) or otherwise. In order to apply video games in the industry such as *The Sims*, which have been applied using multiple languages, Nayar (2010) and Gerber and Scott (2011) have listed the types of commercially available video games that could potentially be adapted for language learning. Studies on video game in curriculum design can be developed further by translating existing English video games into Malay **(Siti Afifah Samsudin,** 2011). Finally, the study on video game design in Malay language learning should develop prototypes or for teaching and learning process as practiced by Muhammad Sabri Sahrir, Nor Aziah Alias, Zawawi Ismail and Nurul Huda Osman (2012) who studied the use of design and development research (DDR) approach in developing a prototype vocabulary game for learning Arabic language online.

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