Digital Game-Based Larning Model and Design Elements to Increase Student Learning Motivation in English Listening Skills

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Abstract—The lack of interactive learning resources in English teaching leads to low student learning motivation. This research aims to propose the DGBL model and design elements to increase student learning motivation in English listening skills. This research used descriptive research methods. Data were collected by interviews, observations, and 3 questionnaires relating to course interest, instructional material motivation, and mobile learning readiness. The result of this study is DGBL model and design elements developed based on ARCS motivational design that has 2 main stage. The first stage is Motivational Processing including dimension of Attention, Relevance, and Confidence. The second stage is Information Processing including the dimension of Satisfaction. The DGBL design elements consists of four elements integrated with the DGBL model: 1) interaction element to gain attention in the form of questions, 2) content element to build relevance in the form of monologues and dialogues that are relevant to students, 3) level element to build confidence in the form of various sets of questions with various levels of difficulty, and 4) objective element to build satisfaction in the form of minimum required score, mission and leaderboard.

Keywords: digital game-based learning, student learning motivation, English listening skills, ARC motivational design

I. INTRODUCTION

One obstacle to access global information is mastery of language. The language is a tool to get to know and learn about new things. In the era of global society, it is necessary to master international languages, namely English so that they can compete with nations from other countries. Trade, tourism and academic activities between countries depend on the use of international languages to avoid misunderstandings. Therefore, the ability to listen, speak, read and write in English is very important for a country that does not use English as a mother tongue.

Many studies have been conducted to study the important factors which influence English learning. It is known that the factors of age, gender, motivation, personal character, learning style, and learning strategies have a major influence on the results of the English learning process [1]. A certain number of studies of learning have also shown that motivation is an important key to learn [2]. Success in learning process is influenced by many factors both from outside and from within students. The learning process will run well and smoothly if it involves the active role of the teacher or the educator

and also the students themselves. Not only that, the use of media as a tool or source of learning is also very important in the success of learning process.

Motivation is one of the determinants of learning success. Many theories about motivation have been developed by psychologists with various methods. The motivational theories that are now developing emphasize cognitive and emotional behavior [3]. Teachers are familiar about intrinsic and extrinsic motivation. Students who are extrinsically motivated to learn will expect rewards in the form of good value or recognition from others not because they enjoy the learning process. Conversely, students who are intrinsically motivated to learn will learn because of their pleasure. Learning that builds intrinsic motivation is very important because students who are intrinsically motivated will tend to seek challenges, participate actively in class and focus on learning rather than focusing on other goals. The intrinsic motivation can be built by elaborating challenge, student curiosity, control in students' learning and imagination [3].

One of the most popular motivational models is ARCS. The ARCS model was developed by John Keller when he was conducting research on motivation as a support in the learning process. This model assumes that humans will be motivated to learn if there are values contained in the learning and there is a high level of expectation to be able to achieve the learning objectives completely [4]. The ARCS stand for Attention, Relevance, Confidence, and Satisfaction. Each of these concepts is a collection of related motivational concepts and theories. The ARCS model consists of integration of research and best practices for motivation and a systematic approach to applying this knowledge to solving motivational problems [5]. On the other hand, progress in the field of wireless communication technology creates a new learning approach called distance learning and mobile learning. The mobile learning uses mobile computing technology to improve learning, and this technology can be combined to engage and motivate learners anytime and anywhere. Mobile learning has many advantages over e-learning, including flexibility, mobility, comfort, low cost, and friendliness [6].

The progress of the development of mobile learning has also triggered digital game-based learning to develop. The digital game-based learning is a learning approach that utilizes games to make learning process be more

attractive and immersive. The use of game-based learning in courses on nutrition found that this approach was more effective in increasing the effectiveness of student's learning and attitudes compared to teaching using PowerPoint media and even influenced their dietary habits [7]. In addition, participants learn more actively and with greater interest, allowing content to be learned to leave a deeper impression than possible using conventional methods [8].

II. METHOD

This research uses descriptive research methods to propose the DGBL model and design elements that can increase student's learning motivation in English listening skills. The results of the analysis are in the form of descriptions of observed data. Two types of data were collected. The first type were quantitative data about student's motivation based on ARCS questionnaires and mobile learning readiness. The second type data were qualitative data about situation and condition in the learning process. The data were collected by interviews, observations, and three questionnaires relating to course interest, instructional material motivation, and mobile learning readiness. The subject consisted of two English teacher and 20 English vocational students who had taken English listening courses. The CIS and IMM survey is adopted from John Keller's ARCS-Based Measures of Motivation [5].

III. RESULTS AND DISCUSSION

A. Problem in English listening skills

Listening is a difficult subject in English because students must be able to understand what other say. To be able to master listening, students must really understand the words which are heard. Listening is not the same as hearing. Listening can be understood like understanding. In English leaning process, listening activities can be done with several learning methods. The most popular method for language learning is drill and practice method. Although, one of the weaknesses of it can make students bored in learning process easily.

Based on interviews with English Lecturers at the Vocational School UGM several problems of English listening subject were found: 1) the students did not have enough opportunities to practice conversations with English lecturers or native speakers, 2) the students must rely on audio books and CDs as their main learning material which leads to deficiencies in oral English, 3) the students do not have the courage to speak, because they are worried that their classmates will laugh at them because of their poor English skills. Based on the students' score of the semester final exam in the listening course II, it was found that the average score ranged from 70 to 73 (B). In addition, it was found that up to 25%, 8 out of 32 students did not have quiz scores and assignments.

TABLE 1. COURSE INTEREST

Aspect	Scores
Attention	3.53
Relevance	3.85
Confidence	3.40
Satisfaction	3.58
Total	14.35

The result of course interest survey shows that all aspects of the course interest are not more than 4 points. The highest score is in the relevance aspect with a score of 3.85 and the lowest score is in the confidence aspect with a score of 3.40. The total of all aspects is 14.35 of a maximum total score is 20.

TABLE 2. INSTRUCTIONAL MATERIALS MOTIVATION

Aspect	Scores
Attention	3.11
Relevance	3.75
Confidence	3.31
Satisfaction	3.89
Total	14.06

Instructional materials motivation's survey shows that the total of all aspect is lower than the course interest survey. This means that instructional materials that used in listening course has lower performance in increasing student motivation compared to students' course interest. Attention has the lowest point which means that instructional materials are not compelling enough to increase student's motivation compared to other aspects.
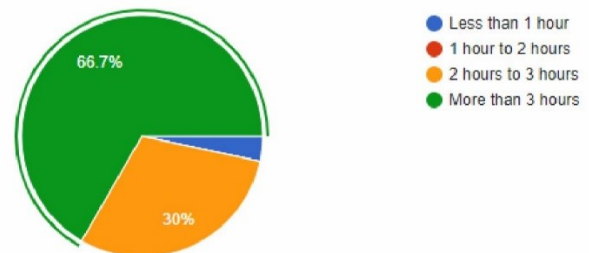

Fig. 1. Frequency of using mobile phones

Mobile learning readiness's survey shows the frequency of using a cell phone among students who exceeded more than 3 hours reached 66.7%. More than 86.6% of students strongly agree and agree that mobile phone helps them to do their assignment and 90% of students need a cell phone that can download educational material from the internet.

B. Digital game-based learning

Based on this results, student's motivation in English listening course can still be improved, especially in the attention aspect and the instructional materials which has the lowest score. On the other hand, the level of mobile learning readiness is already high. Therefore, it is necessary to develop a model that can take advantage of these high level of mobile learning readiness to deal with low level of student motivation. Based on several studies, it has shown that DGBL has great potential to involve students in a complex learning environment. The DGBL is not only provides opportunities for direct learning, it is also able to realize an eclectic group of learning theories to address different learning needs [9]. The DGBL is very suitable to be implemented in mobile learning. Even it is developing precisely because of developments in the field of mobile learning technology.

The great potential that DGBL has can be utilized when the proportion between learning and games is right.

This will be the main challenge facing DGBL developers. The key for a successful instructional game design is the balance of these two aspects. On the one hand, a game that is too focused on learning can be interpreted as a boring and long-winded game, but the games that are too focused on play and no learning have a low instructional impact [10].

C. DGBL model to increase student learning motivation in English listening skills

In order to improve the student's learning motivation in English listening skills, the DGBL model is needed which is combined with the ARCS motivation model. ARCS model was chosen because it focuses on student's motivational processes. It is not paying too much attention to other aspect of learning processes so that it can be easier to focus on research problems. Besides of it, the ARCS model also has components which are suitable for the digital and distance learning process.

The proposed DGBL model to increase student motivation has two main stages. The first stage is the process of motivation (motivational processing) including the dimensions of Attention, Relevance, and Confidence. This process is where the students build enough curiosity to explore learning tasks or game missions (Attention), then understand the values or what he will get in these learning tasks (Relevance), and evaluate the possibility of being able to achieve goals of confidence [9]. In addition, to the process of motivation, participants must go through processing the will of learning then processing information and psychomotor, to be able to cognitively reflect the results. Motivational processing is very important in the early stages of the learning process, but instructional designers must pay attention not to meet learner's processing capacity or not to distract them with too much stimulation. This design consideration is a major concern for DGBL interactive multimedia [9].

Motivational processing for the attention aspect of the DGBL model is to build the story using role playing strategies. The situation design can use situational stories, animations, audio effects and video questions and answers (apperception). The diversity of media is also important to be able to build user attention and towards the learning process [11]. Users can choose the characters they want at the beginning of the game, and produce a sense of identification with the characters they like. The DGBL must also present learning tasks that can be in the form of game missions. The style of the model and the difficulties needed for each task vary. When task one is complete, the level of difficulty will increase. Appropriate and timely feedback features presented with humorous dialogue can increase user interest [12]. The design component in the DGBL for the attention aspect is a component of behavior that must be able to answer the question of what students must to do in the game [10].

The relevance aspect of DGBL must be able to visualize real day-to-day activities to be familiar with the lives of users. Using storyline and context are real or adapted to user characteristics so that users have no difficulty for understanding to the DGBL developed. The point system is also needed for awards. Awards or the number of points obtained in each task are directly

proportional to the number of learning assignments done correctly [12]. The design component that needs to be considered in this aspect is the component of the social, cultural and language context. The DGBL design is expected to be able to answer questions about whether there is a meeting point between the simulated cultural context in the game and the player's culture itself. Can the game encourage students into the social context of the community? What language will the game use? [10].

TABLE 3. SITUATIONS, STRATEGIES, AND COMPONENTS OF DGBL MODEL BASED ON ARCS MOTIVATIONAL DESIGN

Aspect	Design Situations [11]	Design Strategies [12]	Design Components [10]
Attention	1. Situational stories 2. Animation, audio and video effects.	1. Questions and answers (apperception) 2. Role playing 3. Learning task 4. Funny dialogue	Behaviors What do players / student have to do to succeed with the game?
Relevance	1. Visual simulation in everyday life 2. Study in a familiar environment them to question	1. Context and real scenario 2. Real-time display.	Social Context, Culture, and Language (Society, Culture, and Language) 1. Is there a meeting point between the simulated cultural context in the game and the player's culture itself? 2. Can the game encourage players/students into the social context of the community? 3. What language modalities will the game use?
Confidence	1. Objectives are clearly defined. 2. Animation can be rotated forward or backward. 3. Give Q&A and games for review.	1. The process and purpose of story-based game goals.	Conditions & Objectives (Conditions & Resource Objectives) 1. What can players / student do after interacting with the source of the game? 2. What do players / students need to know to interact with the game?
Satisfaction	1. Using the reward system. 2. Using the right Content and evaluation method.	1. Accumulated value. 2. Online update.	Connections & Criteria (Connection & Criteria) 1. How do players / students know that the purpose of the game has been successful? 2. What kind of connection or network does the game have to provide other information?

D. DGBL design elements to increase student learning motivation in English listening skills

Based on the previous discussion, the author develops DBGL design elements to increase motivation in learning English listening skills:

- Interaction: Game interaction is done with questions. Players will be given questions about dialogue or monologues that were read beforehand. The player will then analyze the dialogue and monologue in the form of the audio narrative and provide the appropriate answers. Questions and answers are chosen because they are in accordance with the motivational processing stage to get the player's attention.
- Content: The content of the dialogues and monologues must be closely related in everyday life to improve aspects of relevance to players.
- Level: The game must have a level of difficulty. The level in the DGBL model is in the form of 4 level sets of questions from A to D which are increasingly difficult. The higher the level set of questions, the greater the score given to meet the principle of satisfaction.
- Objective: The game must have a leader board so that players can compete with other players. Besides that, the game must also have missions in the form of a specific target score to give the player a goal. Missions and leader board are useful for increasing the confidence of players.
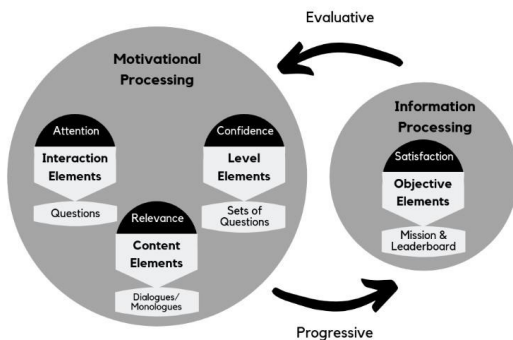

Fig. 2. The DGBL Model and Design Elements

IV. CONCLUSION

English listening skills have an important role in keeping up with the advances in science and technology in the information age. Learning methods that are often used in language learning are in drill and practice. This method often makes students bored in learning because it is done repeatedly. According to the research results, instructional materials that used in English listening course has lower performance in increasing student motivation compared to student's course interest. Attention aspect has the lowest point which means that instructional materials not compelling enough to increase students' motivation compared to other aspects. Both of CIS and IMM survey did not reach 75% (14.35 and 14.06) of the maximum score (20). On the other hand, the level of mobile learning readiness is already high. Therefore, it is necessary to develop a learning model that can take advantage of these high level of mobile learning readiness to deal with low level students' motivation. The proposed learning model

is the DGBL model because it has great potential to involve students in complex learning environments and suitable for digital or mobile learning. The DGBL model developed based on ARCS motivational design by John Keller. The developed DGBL model has two main stage that is Motivational Processing including dimension of Attention, Relevance, Confidence and Information Processing including the dimension of Satisfaction. The DGBL design elements consists of four elements integrated with the model: 1) interaction element to gain attention in the form of questions, 2) content element to build relevance in the form of monologues and dialogues that are relevant to students, 3) level element to build confidence in the form of various sets of questions with various levels of difficulty, and 4) objective element to build satisfaction in the form of minimum required score, mission and leaderboard.

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