

MOTIVATION OF TRAINEE TEACHERS IN CONDUCTING ONLINE LEARNING USING DIGITAL GAMES BASED ON ARCS MOTIVATION MODEL

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ABSTRACT

The endemic situation of Covid-19 plaguing the world today has huge implications for education. This requires teachers to be more creative and innovative in delivering knowledge in the classroom via online learning. However, trainee teachers lack experience and skills compared to professional teachers, which affects the consistency of their motivation. Therefore, this paper discusses the perceived improvement of motivation of trainee teachers based on the ARCS motivation model toward a game-based learning approach through a digital game called StayFit as a teaching tool. This study focuses on four components of ARCS motivational constructs: - i) attention; ii) relevance; iii) confidence; and iv) satisfaction. The research design is quantitative and based on a survey using a questionnaire to collect the data. 56 respondents were involved in this study and the data were analysed using descriptive statistics. The results of this study show that the trainee teachers gave positive feedback through the implementation of digital game-based learning in their online classes especially in terms of enhancing their motivation in the teaching process. The implication of the study shows that the use of digital game as a teaching aid in online learning can increase the motivation of trainee teachers and make the learning process more effective, which meet with the needs of remote learning that applied during this endemic situation.

Keywords: ARCS model, digital games, digital game-based learning, endemic, motivation, trainee teachers, teaching tool

INTRODUCTION

The development of educational technology has led to many variations and new methods in the transmission of knowledge. During the Covid- 19 pandemic that hit the world, schools were closed, so teachers and students had to use online platforms to continue learning. Remote learning is one of the methods used by teachers to deliver their lessons. It offers students and teachers to stay connected to the content and learn from home. Previous studies have proven that students' motivation to learn increases when digital games are used as learning materials (Cankaya & Karamete, 2009; Muhamad et. al, 2018). However, motivation also needs attention from the perspective of teachers especially for trainee teachers. It is because trainee teachers have lack experience compared to senior teachers in conducting classes and they need strongly encouraged to be creative in teaching. Motivation plays an important role in teaching. Motivation is able to help teachers to ensure that students receive an effective learning and teaching process (Pintrich, 1991).

Based on Keller's (1987) ARCS model, there are four elements of motivation that can improve the quality of learning sessions in the classroom; - i) attention; ii) relevance; iii) confidence; and iv) satisfaction which can affect the teaching effects of trainee teachers. Chang et al, (2020) indicate that the ARCS model has been integrated with digital tools to support teaching activities. A good teaching approach that uses digital technologies such as educational games, courseware and learning portals can attract students' attention and interest, increase

students' confidence in the topics and content of learning, help students develop their own learning skills, and finally promote students' satisfaction after learning.

The purpose of this study is to determine the trainee teachers' perception of motivation when using the digital game-based learning (DGBL) approach in online learning based on the ARCS model. A digital game titled StayFit was developed to test trainee teacher's motivation while conducting their online Physical Education and Health class. StayFit is an educational game that teaches its players about nutrition as shown in Figure 1. The main goal of the game is to provide a basic knowledge about food intake and ensure students choose the right food intake to gain energy and perform at their best (see Figure 2). StayFit combines game and multimedia elements to ensure that students are attracted and actively engaged in the teaching and learning process. This study offers several benefits especially for trainee teachers who want to explore different teaching styles and techniques in line with 21st century educational goals.



FIGURE 1. Game Start Interface



FIGURE 2. Main Menu Interface

MOTIVATION IN DIGITAL GAME-BASED LEARNING

It is believed that comprehensive strategic planning and teacher instruction in the use of digital games in the teaching and learning process will improve student mastery of the subject matter and facilitate teacher instruction. Learning is also become a fun activity. This clearly shows that intrinsic and extrinsic motivation can be increased and students' willingness to accept learning occurs naturally. According to Tohidi and Jabbari (2012), motivation is a process that enables a person to fully perform face challenges and obstacles to change. Prihartanta (2015) mentioned that motivation plays a major role in the strategy of a learning session. There are different motivation theories and models that guide the researcher and are adapted to the purpose of their research. One of the motivational models mentioned is the ARCS model. The ARCS model is a motivational design process that includes motivational concepts and theories divided into four components namely attention, relevance, confidence, and satisfaction (Keller, 1987). Each of these components has specific subcategories that analyze students' motivational characteristics in order to help teachers design instructional environments and strategies to engage students' interest in learning. According to Woo (2014), DGBL is one of the instructional approaches that enhance motivation and increase cognitive load to improve learning effectiveness.

In essence, DGBL refers to educational innovations that integrate digital games with educational value for the purpose of learning methods. The purpose of this DGBL is usually to arouse students' interest and motivation to learn the learning content through games. The effectiveness of learning sessions using digital games is supported by the use of appropriate multimedia elements. DGBL has been shown to improve student performance, provide fun learning to students, and increase students' attitudes and motivation (Zaman, Khairulamin & Ibharam, 2020). A study conducted by Nusir et al. (2013), found that the process of two-way communication between students and teachers is excellent. Moreover, the use of digital games in the education is able to stimulate students' mind through the use of multimedia elements

such as text, graphic, audio, animation, and video. The features offered by digital games make students become more motivated to compete with others by earning scores or scores. The experiment conducted by Wang and Lieberoth (2016), focused on five aspects namely, concentration, engagement, fun, learning and motivation. The results of the study showed that students achieved the objectives of the study, which were consistent with the five aspects studied. Students become more motivated during the learning and teaching process. According to Baek (2010), there are several important characteristics that digital games in education must have in order to get students to engage in the learning process. These include in-game challenges, fixed rules, goals and achievements, rewards, problem-solving skills, interactivity, and fun. The results of a literature review on DGBL studies that focus on student motivation revealed the need to investigate the use of instructional tools using digital games to determine the impact on novice teachers' motivation in the online learning environment.

RESEARCH CONCEPTUAL FRAMEWORK

The conceptual framework for this study provides an explanation of the guidelines and pathways in a study, as shown in Figure 3. The StayFit digital game was designed based on Multimedia Learning Cognitive Theory (Mayer & Moreno, 2003). Design principles can be derived from this theory, such as providing coherent verbal, pictorial information, guiding learners to select relevant words and images, and reducing the load on a single processing channel to maintain motivation in the teaching and learning process. The design of this game follows the design principles for developing a game. It has clear goals, achievable challenges, interactions between players and the game, rewards and feedback when players successfully complete the challenges. In this game, the player must choose the correct food proportion before, during, and after the hockey tournament. The player will provide with information of type of food and the number of calories to help them to choose the right food. The choice of food reflects the player's performance. As for the multimedia aspect, this game is equipped with a combination of graphics, audios, and animations that is suitable for learning purposes. The trainee teacher has used this game in a remote learning environment for Physical Education and Health subject.

In this study, the researcher adopted the ARCS model by Keller (1987). It is important to motivate teachers to ensure continuity of motivation during the teaching session. This model is especially important for online learning because teaching in online class is more challenging than in face-to-face class (Davis, Gough, & Taylor, 2019). To find out how trainee teachers perceive motivation, the four (4) components of ARCS model are considered as follows:

1. **Attention:** It refers to the interest of the learner. It is crucial to arouse and maintain the interest and attention of learners. If the trainee teachers succeed in gaining their student's attention, it will enhance the motivation of trainee teachers to continue teaching with enthusiasm.
2. **Relevance:** The learning process should demonstrate the usefulness of the content so that learners can bridge the gap between the content and the real world. Since the content of the subject is in line with the curriculum, the trainee teachers will actively contribute their knowledge to share with their students.
3. **Confidence:** This component focuses on the development of success expectations among learners. The success expectations enable learners to control their learning processes. There is a correlation between self-confidence level and expectation for success. Trainee teachers will be excited if their students can achieve the learning outcomes.

4. Satisfaction: There is a direct correlation between motivation and satisfaction. Trainee teachers should be satisfied with what they have achieved during teaching if they can assess students' performance and positive attitude.

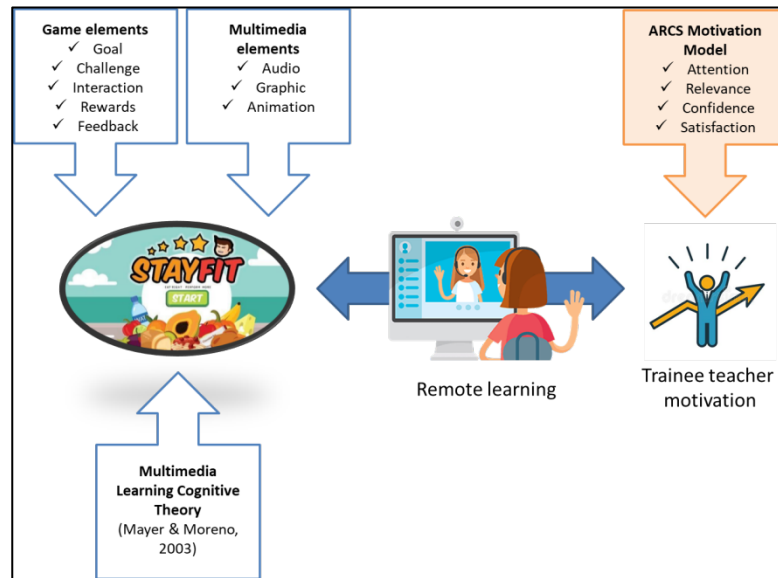


FIGURE 3. Conceptual Framework

RESEARCH METHODOLOGY

This study was conducted using a quantitative study design using descriptive statistical analysis based on a questionnaire instrument using a survey method. The population involved in this study consisted of 4th year undergraduate students studying Sports Science program at Universiti Pendidikan Sultan Idris who underwent 14 weeks of teaching training. These students became trainee teachers who interned in schools around Malaysia and taught the subject of Physical Education and Health. A total of 56 respondents voluntarily participated in this study. Respondents were given one week to evaluate the StayFit digital game based on an explanatory video. Based on a short explainer video, respondents had to give their feedback using a questionnaire form provided by the researcher. The respondents also have to implement the game during their practical classes with real students via online. The measurement scale of the questionnaire items in this research instrument used a five -point Likert scale. This questionnaire was adapted from 'A Manual for the Use of the Motivated Strategies for Learning Questionnaire' (MSLQ) by Pintrich (1991). The constructed questionnaire contains four constructs based on ARCS's motivational model namely, i) attraction; ii) relevance; iii) confidence; and iv) satisfaction. Each construct has five to six items to determine the perceived improvement of trainee teachers based on each component of their motivation. The distribution of feedback is done according to the total mean score obtained from the respondents.

The data obtained were analysed using SPSS (Statistical Package for Social Science) software to measure the mean value and standard deviation to determine trainee teachers' perception of their motivation in using the StayFit game as teaching tool via remote learning. The researchers used the mean value interpretation of Hamidah, Jamal and Khalip (2015) as a reference for interpreting the of mean values, as shown in Table 1. Standard deviation is a value considered in a descriptive data analysis. A standard deviation value from low to medium range indicates that there are small mean differences in the distribution of these means (Ramlee, 1999).

TABLE 1. The Mean Value Analysis Interpretation

Mean Value	Interpretation
1 to 2.33	Low
2.34 to 3.66	Medium
3.67 to 5	High

FINDINGS

TRAINEE TEACHERS' PERCEPTIONS OF THE STAYFIT GAME AS A TEACHING TOOL TO IDENTIFY THE ATTENTION CONSTRUCT IN THE ARCS MODEL

The Attention construct is concerned with student attention and concentration in the online class. Students' attention and engagement will increase trainee teachers' motivation in teaching sessions. Table 2 shows that the mean value for each item is at a high level (total mean = 4.63). The results of this study demonstrate that using digital games as teaching tool can increase trainee teachers' motivation if students are able to concentrate and actively participate in class for a long period of time. The findings of this study are consistent with the study conducted by Zirawaga, Adeleye and Tinovimbanashe (2017) that stated the use of digital games in the classroom can attract students and make students focus longer period of time which in turn can increase teachers' motivation.

TABLE 2. Mean and Standard Deviation Value on Attention Construct

Item	Mean Value (m)	Standard Deviation (sd)	Interpretati on
I believe that using the StayFit game will make my students more engaged in the classroom.	4.62	.55	High
I will teach with more enthusiasm when using digital game as teaching tool to keep my students' attention.	4.55	.56	High
I am confident that the concept of game -based learning in StayFit will keep students attention during online class.	4.58	.56	High
I believe that students will stay focused when playing the StayFit game compared to using the old/ conventional methods.	4.75	.43	High
I believe that my students will be participated actively while learning with the StayFit game.	4.67	.47	High
Total Mean Value	4.63	.51	High

TRAINEE TEACHERS' PERCEPTIONS OF THE STAYFIT GAME AS A TEACHING TOOL TO IDENTIFY THE RELEVANCE CONSTRUCT IN THE ARCS MODEL

The Relevant constructs discuss the relevance of digital game content to be used as teaching tool in remote learning. The content of teaching tool that are relevant and appropriate to students and the environment is important to increase the teachers' motivation to produce effective and efficient teaching sessions. Table 3 shows that the mean value for each item is at a high level (total mean = 4.62). The results of this study indicate that the use of digital games as teaching tool is relevant and appropriate to the curriculum set by Ministry of Education Malaysia, especially when it involves content that relates to real-life situations. The findings

of this study are in line with the study conducted by Petri, Wangenheim and Borgatto (2017), students' effectiveness process is increased when the main content of the digital games in education matches the curriculum and the challenges in the digital games can be applied to the real world.

TABLE 3. Mean and Standard Deviation Value on Relevance Construct

Item	Mean Value (m)	Standard Deviation (sd)	Interpretation
I am sure that the content of the StayFit game aligns with the learning objectives for the topic of Health Concepts and Healthy Lifestyle.	4.64	.51	High
I expect the StayFit game to contain challenges that can be solved in the real-life.	4.71	.45	High
I expect my students to be able to apply the knowledge from the StayFit game to solve the real-world problem.	4.57	.53	High
I am sure that the StayFit game is appropriate as a teaching tool for the subject of Health Concepts and Healthy Lifestyle.	4.62	.52	High
I believe that the information in this StayFit game meets the needs of students to master the subject of Health Concepts and Healthy Lifestyle.	4.58	.62	High
Total Mean Value	4.62	.52	High

TRAINEE TEACHERS' PERCEPTIONS OF THE STAYFIT GAME AS A TEACHING TOOL TO IDENTIFY CONFIDENCE CONSTRUCT IN THE ARCS MODEL

The Confidence construct addresses trainee teachers' confidence in using the digital games in teaching to be able to facilitate effective learning and thus increase trainee teachers' motivation. Referring to Table 4, the mean value for each item is at a high level (total mean = 4.68). A study conducted by Petri, Wangenheim and Borgatto (2017) showed that the use of digital games as a teaching tool convinces teachers to deliver good lessons to students. The features available in this teaching tool can make teacher's task easier and increase their motivation for teaching.

TABLE 4. Mean and Standard Deviation Value on Confidence Construct

Item	Mean Value (m)	Standard Deviation (sd)	Interpretation
I am confident that my students can learn better with the StayFit game compared with the traditional method.	4.66	.51	High
I am confident that the use of StayFit games in my teaching will be effective.	4.58	.53	High

I am confident that my students will achieve the learning objectives using StayFit game.	4.66	.47	High
I would like the method used in this StayFit game to be used in other subject areas as well.	4.62	.48	High
I am confident that learning through StayFit games will increase my students' interest in learning.	4.67	.50	High
Total Mean Value	4.68	.60	High

TRAINEE TEACHERS' PERCEPTIONS OF THE STAYFIT GAME AS A TEACHING TOOL TO IDENTIFY SATISFACTION CONSTRUCT IN THE ARCS MODEL

The satisfaction construct discusses trainee teachers' satisfaction with the use of digital games as a teaching tool in online class. Positive student behavior and reaction, interesting learning experiences, and students' desire to continue the learning session provide satisfaction to the trainee teacher. In addition, the usability of the StayFit game helps trainee teachers to conduct their online teaching easier and provide satisfaction in teaching. According to Huizenga et al, (2017), the attitudes and behaviors that students exhibit during playing the game shown an impression and inspire the teacher to teach. These beliefs about the learning opportunities have the strongest direct influence on teacher's intention to use games (De Grove et, al, 2012). The data obtained (see Table 5) show that trainee teachers' satisfaction when using digital games as teaching tool increases trainee teachers' motivation and leads to effective teaching. The results of this study are consistent with Anastasiadis, Lampropoulos, and Siakas (2018). Changes in students' soft skills in various forms and maintaining a healthy and balanced mental and psychological state increase teachers' satisfaction and motivation. This finding also supported by the results of a study conducted by Muhamad et al. (2018), which shows that students seem to be more motivated by the behavior of not giving up, daring to try and continuing to strive to achieve learning objectives when using digital games and teachers' motivation also increases when their students are highly motivated.

TABLE 5. Mean and Standard Deviation Value on Satisfaction Construct

Item	Mean Value (m)	Standard Deviation (sd)	Interpretation
StayFit game helps me to conduct my online class more easily.	4.55	.53	High
StayFit game gives me satisfaction in teaching.	4.60	.56	High
I am sure that my students will have fun if they can give the correct answer while playing the StayFit game.	4.71	.45	High
I will recommend this game to other teachers to use in their classes.	4.69	.53	High
I am sure that my students will ask me to use another educational game in the next online class.	4.55	.53	High
Total Mean Value	4.62	.52	High

CONCLUSION

Based on the results of the study, the researchers found that the perception of trainee teachers perceived motivation to be positive when conducting learning and teaching sessions using digital games as teaching tool, especially in a remote learning environment. The four components of the ARCS model examined, namely, attention, relevance, confidence, and satisfaction recorded high mean values for each item. This proves that trainee teachers are more motivated when they use the digital game as a teaching tool in online class. Teaching styles and techniques are capable of increasing trainee teachers' motivation and catalyzing students' attitudes toward effective learning (Han & Yin, 2016). Trainee teachers can also use systematic DGBL strategies to overcome their weaknesses to motivate students, which affects the teaching and learning environment. The results of this study are also consistent with the results of a study conducted by Petri, von Wangenheim, and Borgatto (2017) in which trainee teachers feel confident about using digital games as teaching tool in the future. This study also has good implications, especially for trainee teachers in seeking new alternative learning methods and techniques to increase their self-motivation. In conclusion, this study can be beneficial for the trainee teachers who have just ventured into the education field and are teaching a new generation. The use of digital games in education brings variety to the system of 21st century learning in Malaysia. Teaching tools with digital integration in learning sessions can create a conducive learning environment and increase teachers and students motivation.

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