

Integration of the ARCS Motivational Model in Digital Game-based Learning for Sustaining Student Engagement in Communication

Mohammad Taufiq Abdul Ghani¹, Wan Ab Aziz Wan Daud² and Kamaruzzaman Abdul Manan³

Abstract

Digital game-based learning is an instructional method that teaches students through games and other forms of entertainment. Digital games have the potential to naturally drive players to participate in an activity, which can be beneficial for learning. One of the essential factors in achieving success in second language acquisition is motivation. This research seeks to present a digital game-based learning framework integrated with the ARCS motivating paradigm to achieve this goal. Each of the four primary motivational factors elements is represented by an ARCS component. Attention (A), Relevance (R), Confidence (C), and Satisfaction (S) are the four components of motivation. This paper provides a high-level overview of the suggested framework, which is divided into three parts: input, process, and output. It is possible that the framework proposed will be useful to a wide range of stakeholders, including students, instructional designers, programme designers, and language practitioners. This research described a method for developing a successful digital game that included motivating components to keep learners engaged throughout the learning process.

Keywords: ARCS Model, Digital Game-Based Learning, Teaching and Learning, Learning Engagement, Language Acquisition.

INTRODUCTION

Motivation is one of the factors to success in second-language learning. Gardner (1982) describes the student's motivation as composed of three components that are effort (the student's time spent studying and student's drive), desire (the acquisition of language skills) and affect (the acquisition's emotional reactions to study). In contrast, Keller (2010) described motivation as the mechanism which triggers, controls and maintains target-oriented behaviour. Some academicians, including Brown (2007) and Dornyei (2005), have emphasized three aspects of learning motivation. Firstly, stimulating the desire for learning. Motivation is the energy that allows learning to take place and encourages learners to study and focus on their educational content. Second is defining the direction of the goal. According to Zhang (2013) and Mohammad Taufiq et al. (2022), learning motivation helps students who want to learn, and target orientation means the consistent pattern of motivation that drives individuals to develop their abilities by acquiring new skills and integrating different conditions and eventually giving a response. Third, maintaining learning behaviour. Motivation will maintain the actions and motivation of the students in order to complete learning tasks and produce new incentive to begin further learning (Hasbullah et al., 2022;). Students with different levels of motivation lead to different learning behaviours (Li & Keller, 2018; Che Ahamad et al, 2023).

Digital Game-based Learning Principles

There are various principles of game-based learning to be considered by researchers. Extensive research has repeatedly tried to shine a light on game concepts that generate interaction, inspiration and flow. Malone (1981) suggested that the theory of intrinsically motivating instruction is organised in three categories; challenge, fantasy, and curiosity. Challenge is hypothesised to depend on goal with uncertain outcomes such as variable difficulty, multiple level goals, hidden information and randomness. Fantasy is claimed to have both cognitive and emotional advantages in designing instructional environments. While curiosity is separated into sensory and cognitive components, and it is suggested that cognitive curiosity can be aroused by making students believe their knowledge structures are incomplete and inconsistent. Malone (1981) found that imagination or

¹ Faculty of Languages and Communication Universiti Pendidikan Sultan Idris, Email: taufiq@fbk.upsi.edu.my

² Faculty of Languages and Human Development Universiti Malaysia Kelantan

³ School of Communication Universiti Sains Malaysia, (Corresponding Author: Email: kamaruzzaman@usm.my)

pleasurable content, control, challenge and curiosity were the primary values that mattered the most. He then improved the model by adding concepts of collaboration and competition (Malone & Lepper, 1987).

Bowman (1982) state that the flow and motivation of players can be maintained by presenting players with a clear mission, making player choices available and combining learner skills with constructive challenges. While, Prensky (2001a) suggested related reasons to build computer games engagement: straightforward rules, specific goals and objectives, direct and immediate feedback, continuous challenge and competition, interaction and an immersive storyline. Garris et al., (2002) highlighted six game characteristics that facilitate player motivation. These characteristics are fantasy, rules or goals, sensory stimuli, challenge, mystery and control. In addition, Sweetser and Wyeth (2005) outlined eight core game flow principles that facilitate player enjoyment and engagement. The principles are concentration, challenge, skills, control, clear goals, feedback, immersion and social. The table below illustrates the description of each principle.

Table 1: Sweetser and Wyeth's Game Principles

Principle	Description
Concentration	Players should pay attention and the player should be in a position to concentrate on the game.
Challenge	Games should be challenging enough and suit the skill level of the player.
Player Skills	Players shall support the development and mastery of player skills.
Control	Players will feel a sense of power in the game regarding their action.
Clear Goals	Games will set clear goals for the player at appropriate times.
Feedback	Player shall provide appropriate feedback in due time.
Immersion	Players should have deep yet effortless participation in the game.
Social Interaction	Games will endorse social interaction and build opportunities.

Bober (2010) also proposed five game principles which are: 1) challenge, 2) fantasy, 3) feedback, 4) goal, and 5) sensory stimuli. While Mayer (2014) proposed five main principles of game, which are: 1) rule-based simulated system, 2) responsive to the player, 3) challenging, 4) cumulative, allowing for assessment of progress towards goals, and 5) inviting, offering appeal and interest for the learners. Tan (2015) also explained the five game principles, which consisted of five main principles, which are 1) goal, 2) gameplay, 3) feedback, 4) game space, and 5) game narrative.

Plass, Homer, and Kinzer (2015) discussed the fundamental game design concepts comprising learning goals and related material and competencies. First and foremost, it is the game mechanics. Game mechanics explain the various movements, attitudes and control mechanisms provided to the player in the context of the game (Hunicke et al., 2004). To put it another way, game mechanics is the basic play function players execute over and over again (Salen & Zimmerman, 2004). Both types of activities may have learning emphasis (learning mechanics) or assessment focus (mechanics of assessment), or both (Plass & Homer, 2012). In total, players must learn the fundamentals of the mechanics of the game in order to play, as well as identify the goals and purpose of the mechanics and what actions players need to do.

Second is visual aesthetic design. The visual aesthetic design is the overall look and feel of characters from the game. This defines how resources and game mechanics are visualized, how cue is portrayed and how feedbacks are expressed, which means it has both a cognitive and an artistic purpose. This also forms the reflection of knowledge about the interactive learning elements of the game. Third is the design of the narrative. The plot is the game scenario offering context material for learning, linking play codes, personalities, activities, incidents, and incentives. Games can use non-linear storylines, which are focused on student's choices.

Fourth is the incentive system. The incentive system is motivational elements in order to invite players to pursue their attempts to play the game, such as scores or points, stars, medals, prizes, power-ups, coins, and many other incentives. Such bonuses may be either an inherent aspect of the gameplay, for instance, a power-up that allows the player extra powers in the game, or an extrinsic component such as awarding points or stars for finishing the gameplay via the leaderboard. Fifth is the musical score. The musical score is a background tone that is frequently used to raise the attention of players in crucial things, or moments in the game, to signal risk or chance or to indicate the task's success or loss. The musical score could be in the form of voice, gender or music tone. Last but not least, is subject matter material and abilities. The material and expertise will have a significant influence on the game concepts as they will decide the learning methods to be used, the graphic design to be implemented, the plot nature, the reward system and the musical score (Plass & Homer, 2012).

The figure below shows the circulation of game-based learning principles as proposed by Plass, Homer, and Kinzer (2015).

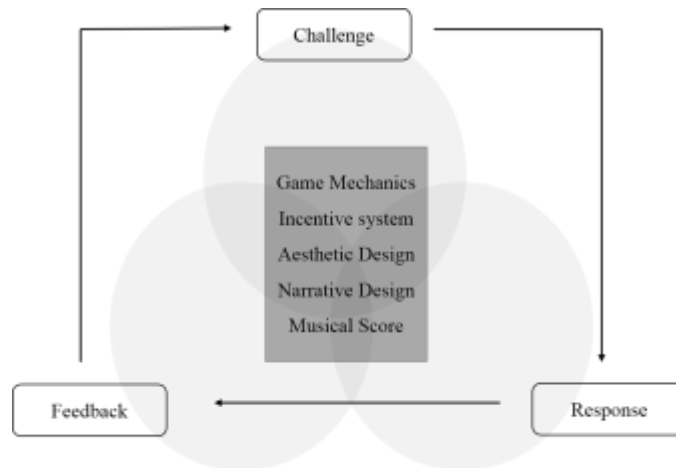


Figure 1: Plass, Homer, and Kinzer’s Game Principles

While Clark and Mayer (2016) also registered six principles of a game which are: 1) Match game type to learning goals, 2) make learning essential to game progress, 3) Build in proven instructional strategies, 4) Build in guidance and structure, 5) Manage complexity, and last 6) Make relevance salient. Based on the scholars’ opinion on games principles and characteristics which engage players, there are several common principles that can be identified. The table below provides a description of the game values defined as essential to player interaction.

Table Error! No text of specified style in document.: Summary of Game Principles Identified as Key to Player Engagement

Authors	Game Principles
Malone (1980)	Challenge, fantasy, curiosity
Malone (1981)	Pleasurable content, control, curiosity
Malone & Lepper (1981)	Fantasy (pleasurable content), control, curiosity, collaboration, competition.
Bowman (1982)	Clear task, identifiable roles and responsibilities, player choices, balancing player skills and challenges.
Prensky (2001)	Rules, goal and objectives, feedback, challenge and competition, interaction and an immersive storyline
Garris et al. (2002)	Fantasy, rules/ goals, sensory stimuli, challenge, mystery, control.
Sweetser & Wyeth (2005)	Concentration, challenge, skills, control, clear goals, feedback, immersion and social.
Bober (2010)	Challenge, fantasy, feedback, goal, sensory stimuli.
Mayer (2014)	Rule-based simulated systems, responsive to player, challenging, cumulative, inviting.
Plass et al. (2015)	Game mechanics, visual aesthetic, narrative design, incentive system, musical score.
Tan (2015)	Goal and rule, game play, feedback, game space, game narrative.
Clark & Mayer (2016)	Goals, essential to game progress, instructional strategies, guidance and structure, manage complexity, relevance salient.

The ARCS Motivational Design Model

The ARCS Model of the motivational design was developed by Keller (1983) that is based on the theory of expectation-value, reinforcement theory, and cognitive evaluation theory. Through a program study of when and how each describes the relationships between effort, achievement and satisfaction, these theories are implemented. The ARCS paradigm consists of four principal motivating factors elements. The components are Attention (A), Relevance (R), Confidence (C), and Satisfaction (S). Such definitions define the motivational circumstances for individuals. It was derived from systematic analysis and synthesis of the scientific and motivational principles. The ARCS model is distinct among existing models of motivational design in that it is a problem-solving approach that lets a teacher recognise and address particular motivational problems relevant to the instructional appeal. Often contains approaches related to the content design, teaching style and overall course design (Keller, 1987b; 1987c; 1999).

Attention is one of the ARCS motivational model component, and it becomes pre-conditions in the learning process (Keller, 1987). Attention is a student response towards the stimulus provided by teaching materials (Huang et al., 2006). It also discusses the concentration shown by students in understanding the framework or concepts. Obtaining the student’s attention is the most crucial part because it will be a motivational trigger. When a student has an interest in a topic, they will be ready to spend time, pay attention and study further toward that topic. Therefore, various multimedia elements used in the development of teaching material can attract student’s attention.

Relevance emphasizes that students can relate their previous learning experience to teaching materials. It also allows students to apply their prior knowledge and abilities in the assignment (Huang et al., 2006). In other words, what the students learnt should be relevant for their current study and future (Christopher, 2015; Keller, 1987). Besides, for the intention of ensuring the success of the educational process, the relevant element should be established to motivate students. Educators are invigorated to use language, analogies or stories to which the students can relate (Christopher, 2015).

The confidence element helps the students to believe that they can succeed. Students’ motivation will diminish if they believe they cannot achieve their goals (Christopher, 2015). Students should monitor their learning process and give them a sense of dignity and accountability for their good learning. In addition, giving feedback also one of the important determinants of students motivation. Students may be frustrated because they are unable to monitor their success in learning. Feedback is also essential in helping students to progress to the next level of learning or to review the previous lesson comfortably.

The final part of the ARCS motivation model is satisfaction. The ARCS model conceptualised a clear relation between intrinsic or extrinsic fulfilment and degree of motivation. Students should be proud and content with what they have learned in learning (Christopher, 2015). The learning process must present students with reward by recognising their achievement and effort throughout the learning process. Besides, students should be stimulated to utilise the gained knowledge and skill in the actual setting (Mohammad Taufiq & Wan Ab Aziz, 2023). It will offer student inner satisfaction as they will observe that the learned experience and skills will be valuable in the future. The table below explains the description of the ARCS model of motivational design.

Table 3 Description of the ARCS Model of Motivational Design

Categories	Sub-categories	Descriptions
Attention	Perceptual Arousal	Seizing learner interest.
	Inquiry Arousal	Motivating interest using e-learning.
	Variability	Sustaining learner attention.
Relevance	Goal Orientation	Meeting learner needs and recognise their needs.
	Motive Matching	Connecting e-learning material with learner’s personal interest.
	Familiarity	Fixing e-learning material to learner experiences.
Confidence	Learning Requirements	Building positive expectation for success when using e-learning content.
	Success Opportunities	Using e-learning material support or improve the capability of learners.
	Personal Responsibility	Connecting e-learning success to personal determination and ability.
Satisfaction	Intrinsic Reinforcement	Encouraging and supporting the intrinsic learner enjoyment of the e-learning experience.
	Extrinsic reward	Providing positive reinforcement to learner success with the e-learning.
	Equity	Convincing the learner to fair treatment.

ARCS in Digital Game-Based Learning

Digital game-based learning is an instructional method that uses games and entertainment to teach the students. Digital games could intrinsically motivate players to engage in the activity, which can benefit learning (Garris et al., 2002). Intrinsic motivation translates to performing an activity in itself because it is generally fun and enjoyable. Whereas extrinsic motivation applies to doing an action as it would end in a different outcome (Ryan & Deci, 2000; Ryan & Deci, 2000a). The concept of intrinsic motivation is relevant for digital game-based

learning as it performs activities with a higher level of enjoyment, interest, performance, higher quality of learning and self-esteem (Ryan & Deci, 2000).

There are various studies employing the ARCS motivational model in designing digital game-based learning to stimulate students' motivation (Hao & Lee, 2019; Travis, 2018; Lu et al., 2018; Huang & Oh, 2018; Wu, 2018; Chang et al., 2017). Chang et al. (2017) combined the ARCS motivational design model dimensions with a game design concept to create a Kinect-based immersive gaming framework to increase learning motivation and impact of gaming. Many gaming features implemented into a gaming model in the learning process enabled students to have fun while studying and increased their participation in learning exercises. The study found that the ARCS model successfully increased active learning motivation.

Hao and Lee (2019) evaluate an educational augmented reality (AR) game incorporation with the ARCS motivational design model to increase student motivation in English language learning classroom. This analysis showed that students who obtained AR game lessons demonstrated substantially higher motivation for learning than students who had a conventional learning experience. Multimedia feature and role-playing 3D graphics are the most essential in the design of AR games (Hao & Lee, 2019) because they provide full fulfilment with the other enjoyable storylines and interactive characters (Wu et al., 2013; Wan Daud et al., 2022). Besides, the learning materials with animations also help to stimulate the visual sense and enhance student learning motivation (Lee & Hao, 2015). The digital game is beneficial to learning because the different multimedia used will boost student engagement as well as emotion (Baskaran & Muhammad Ihsan, 2017).

Huang and Oh (2018) found in their study of the digital game-based educational environment, the focus and self-confidence dimensions of the ARCS motivational design model were relatively more prominent in increasing student motivation in learning through digital game. Both dimensions may signify intrinsic motivational backing in the digital game-based learning environment. Huang, Johnson and Han (2013) suggested that attention and confidence could directly predict overall satisfaction towards a digital game-based learning environment. Intrinsic motivation is an efficient and essential dimension for learning, particularly when students have full control in choosing when, what and how to learn (Huang & Oh, 2018; Hassan & Ismail, 2020). Whereas, according to Woo (2014), the attention dimension must be compromised; however, relevance, confidence and satisfaction dimensions do not conflict in order to increase student motivation.

Yurdaamargan et al. (2015) found in another experiment that digital game can boost excitement, performance, and motivation better than the conventional process. The game has improved students' satisfaction, confidence and enhance their attention. It also offers an opportunity for students to do a discussion regarding their knowledge and information while competing with themselves and others (Khairuddin & Mailok, 2020).

In regards to the Arabic language, Hamizul and Nik Mohd Rahimi (2015) describe an attempt to design and create an online game for Malaysian high school learning for the Arabic language. The researchers adapted the concepts of interactive game-based learning, pedagogical elements and ARCS motivation model to fit online prototype Arabic game. The suggested mechanisms in the Arabic online game prototype are as follows: 1) Pedagogy elements focused on learning objectives, curriculum needs and learning theories. 2) While game principles proposed are a challenge, fantasy/ narrative, feedback, goal, and sensory stimuli. 3) Both are embedded with ARCS models, which is a strategy for problem-solving in developing the positive elements of learning experiences that stimulate and maintain the desire of students to study. The four dimensions of the ARCS model are attention, relevance, confidence, and satisfaction. The use of games in education, especially in the teaching and learning of second languages, is not a novel idea.

Integration of ARCS in Digital Game-based Learning Principle

There are various principles of game-based learning to be considered by researchers. Extensive research has repeatedly tried to shine a light on game concepts that generate interaction, inspiration and flow. There are various digital game-based learning principles suggested by scholars, and this study employed the digital game-based learning principles by Bober (2010).

Bober (2010) offers an outline of what constitutes a video game engaging, gives a taxonomy of its learning elements, and proposes a collection of design concepts for interactive game-based learning environments that

are challenge, narrative, feedback, goal and sensory stimulation. In addition, this principle seems suitable to promote a fun and interactive environment. The explanation of each principle is tabulated in the table below.

Table 4 Bober's Digital Game-Based Learning Principles

Game Principles	Description
Challenge	A test of the student's skills, set at a level to stretch their abilities.
Fantasy/ Narrative	Imaginary environment, characters or story which can stand as a metaphor for the real world.
Feedback	Response to the student's actions or progress within the game.
Goals	Clear aims that are meaningful and achievable but stretch the student's abilities.
Sensory stimuli	Engaging visual and sound effects.

According to Bober (2010), a digital game-based learning experience can use imagination and storyline to create and engage meaning with a learning experience. The interactive game will cater to the learners' prior desires and will have easy, achievable goals. Furthermore, the interactive game should be challenging, with adaptable and increasing difficulty levels, as well as visually appealing, with the use of multimedia elements such as texts, audios, animations, visuals, and videos. Furthermore, in order to offer students a sense of control, the interactive game should have instant feedback. Furthermore, in order to support student experiences of meaningful learning, the digital game should enable students to make choices and promote social engagement among learners.

It is not necessary to include all of the elements in order to create an engaging game-based learning environment (Bober, 2010). Instead, it can include a variety of elements in order to engage a diversity of learners. According to Bober (2010), popular digital game-based learning principles listed include fantasy or narrative, feedback, goal, sensory stimuli, and community. As a result, it is important to adopt the five principles proposed by Bober (2010) since they are universal principles that must be included in digital game-based learning, and these principles are also suggested by other scholars.

In order to gauge student's motivation, the ARCS model that emphasizes the learning environment's motivational aspects suggested to be integrated in digital game-based learning. There are four key components which are attention, relevance, confidence, and satisfaction. Here are the outline proposed to integrate the ARCS in the digital game-based learning principles.

First to gain a student's attention (A), there are several methods have been proposed. First is the inquiry arousal method was employed to stimulate students' curiosity by presenting the students with a set of problems in the form of a game that students need to solve. The digital game itself would encourage the student to participate and engage in the learning activity. There are three levels in the game that provide higher chances to sustain the engagement in learning. Second, the game proposes to use the "conflict" method by providing several repetitions that occur in delivering the information. The repetition aims the students to revise that particular information indirectly. The students have to use previous information to solve the current conflict in the game. In other words, the students need to store the information and used them at the following level. This is to emphasize the connection between game and level. This method could also grab their attention as they will want to learn more on that particular topic. Third, the game should provide a variety of media. The game which offering interactive multimedia in presenting information such as graphic, icons, audio and word to avoid dull and boredom in the classroom.

The second requirement is relevance (R). The digital game should establish relevancy in order to motivate the students. The relevance element ensures that the content presented has perceived of value to the student. To accomplish this, the developer should follow several relevance strategies. First, all the contents of the digital game are must be in line with the syllabus. Therefore, it will be worth it for them to play as they learn not only for their examination but also to enhance their knowledge in an interactive and fun environment. Second, the game must have the element of perceived future usefulness. The digital game should equips the students with a new skill that will help them to resolve their current issue, such as higher-order thinking skill, making strategies, and learning to store information in long-term memory.

The third requirement of motivation is confidence (C). Confidence includes setting a clear objective, providing frequent opportunities to them to success, allowing them to make personal choices about the content and

sharing meaningful feedback. In regards to this, the digital game should provides a clear objective of the game in the main menu. The student will be able to analyse the game concept and its objective before they start playing. Besides, the game is always offering opportunities to the players to success in each game by providing a non-linear progression. The student could repeat several times playing the same game and level until they win and get the reward. Besides, the non-linear progression concept also enables them to choose which game and which level they want to play. The games should be organised from easy to hard and from simple to complex for confidence development. However, it is always to prefer the students to start from the beginning to ensure they are mastering every topic and ease the teaching and learning process. In addition, the game also provides sharing meaningful feedback by providing direct and interactive feedback at the scoreboard. All the scores will be archived in the score section menu. Hence, the students are able to reflect and track the improvement in their study.

The final requirement for motivation is called satisfaction (S). Satisfaction involves giving students meaningful learning results that include intrinsic as well as extrinsic. Students should be proud of their successes throughout the digital gameplay. In regards, the game should provides immediate and interactive feedback for instance by using audio and icon. Every highest score for each game must be recorded. The table below summarises the incorporation of the ARCS model in the digital game-based learning.

Table 5: Incorporation of ARCS Motivational Design Model in Educational Digital Game

ARCS	Digital Principles	Game	Game Design
Attention	<ol style="list-style-type: none"> 1. Sensory stimuli 2. Challenge 3. Fantasy 	<ol style="list-style-type: none"> 1. 2. 3. 	<ol style="list-style-type: none"> 1. Using an entertaining game to stimulate student motivation, interest, and prompt active learning 2. Using "conflict" method 3. Presenting interactive multimedia content
Relevance	<ol style="list-style-type: none"> 1. Challenge 2. Fantasy 	<ol style="list-style-type: none"> 1. 2. 	<ol style="list-style-type: none"> 1. Relevance content to students 2. Provide perceived future usefulness
Confidence	<ol style="list-style-type: none"> 1. Determine the goal 2. Feedback 3. Fantasy 4. Challenge 	<ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 	<ol style="list-style-type: none"> 1. Provide clear objectives 2. Provide meaningful sharing feedback 3. Provide frequent opportunities to achieve success 4. Personal choice of content learning 5. Games are organised from easy to hard 6. Providing direct interactive feedback scoreboard
Satisfaction	<ol style="list-style-type: none"> 1. Sensory stimuli 2. Feedback 	<ol style="list-style-type: none"> 1. 2. 	<ol style="list-style-type: none"> 1. Provide immediate and interactive feedback 2. Proper evaluation

CONCLUSION

The objective of this study is to introduce a novel approach by incorporating the ARCS motivational design paradigm into the field of digital game-based learning. According to Keller (2010), the ARCS model encompasses four fundamental components of motivation, namely Attention, Relevance, Confidence, and Satisfaction. This study suggests that these factors might be methodically integrated into the instructional structure of digital games. In order to enable this advanced integration, the researchers thoroughly delineate a multi-stage procedure, which includes the initial conceptualization and subsequent creation of a digitally immersive instructional setting.

The suggested procedures encompass, but are not restricted to, the determination of learning goals based on well-established educational theories, the adaptation of game mechanics to conform with the ARCS framework, and the repeated evaluation of motivational resources within the game's storyline and gameplay components. This study emphasizes the need for empirical research to operationalize these integrative categories, considering their universal nature. The research pathway being proposed entails the creation of an educational digital game that integrates the motivational concepts of the ARCS framework with the principles of digital game-based learning.

Significantly, the effectiveness of this game would be assessed by conducting a longitudinal study to examine its influence on student motivation throughout the duration of the educational session. In order to determine

the degree to which motivational factors contribute to cognitive engagement, intrinsic interest, and educational outcomes, it would be necessary to employ rigorous quantitative and qualitative research methods. The findings of this investigation have significant significance, as they have the potential to bring about fundamental changes in the development of educational technology. Additionally, these findings contribute to the existing body of knowledge in the fields of motivational psychology and instructional design.

REFERENCES

- Baskaran, G. & Muhammad Ihsan, M. R. (2017). Emotion Digital Game-Based Learning Application: ARCS Motivational Model? *International Journal of Advanced Computational Engineering and Networking*, 5(9), 141-148.
- Bober, M. (2010). *Games Based Experiences for Learning*. Bristol: Futurelab.
- Bowman, R. F. (1982). A "Pac-Man" Theory of Motivation: Tactile Implications for Classroom Instruction. *Educational Technology*, 22(9), 14-17.
- Brown, L. V. (2007). *Psychology of Motivation*. New York: Nova Science Publishers.
- Chang, Y. -H., Hwang, J. -H., & Fang, R. J. (2017). A Kinetict-and Game-Based Interactive Learning System. *EURASIA Journal of Mathematics Science and Technology Education*, 13(2), 4897-4914.
- Che Ahamad, M. H., Zulklepi, N., & Tan, H. S. (2023). English Language Learners' Readiness towards Mobile Assisted Language Learning. *AJELP: Asian Journal of English Language and Pedagogy*, 11(1), 134-146.
- Christopher, P. (2015). *Instructional Design Models And Theories: Keller's ARCS Model Of Motivation*. Retrieved from eLearning Industry: <https://elearningindustry.com/arcs-model-of-motivation>
- Clark, R. C. & Mayer, R. E. (2011). *E-Learning and The Science of Instruction*. San Francisco: Pfeiffer.
- Dornyei, Z. (2005). *The Psychology of The Language Learner: Individual Differences in Second Language Acquisition*. Mahwah, NJ: Lawrence Erlbaum.
- Gardner, R. C. (1982). Language Attitudes and Language Learning. In E. B. Giles, *Attitudes Towards Language Variation* (pp. 132-147). London: Edward Arnold.
- Garris, R., Ahlers, R. & Driskell, J. E. (2002). Games, Motivation and Learning: A Research and Practice Model. *Simulation & Gaming*, 441-467.
- Hamizul, M. & Nik Mohd Rahimi, N. Y. (2015). Design and Development of Arabic Online Games: A Conceptual Paper. *Procedia Social and Behavioral Sciences*, 174, 1428-1433.
- Hao, K. -C. & Lee, L. -C. (2019). The Development and Evaluation of an Educational Game Integrating Augmented Reality, ARCS Model, and Types of Games for English Experiment Learning: An Analysis of Learning. *Interactive Learning Environments*.
- Hasbullah, N. H., Rahmatullah, B., Mohamad Rasli, R., Khairudin, M., & Downing, K. (2022). Google Meet Usage For Continuity And Sustainability Of Online Education During Pandemic. *Journal of ICT in Education*, 9(2), 46-60.
- Hassan, M. F., & Ismail, A. (2020). Pengaruh Gaya Pembelajaran dan Kecekapan Murid dalam Penggunaan E-Pembelajaran: Influence of Students' Learning Style and Efficiency on the Usage of E-Learning. *Journal of ICT in Education*, 7(1), 58-64.
- Huang, W. D. & Oh, E. G. (2018). Motivational Support from Digital Game-Based Learning Environments (DGBLEs) for Scientific Topics Designed by Novice End Users. *Educational Media International*.
- Huang, W., Huang, W., Diefes-Dux, H., & Imbrie, P. K. (2006). A Preliminary Validation of Attention, Relevance, Confidence, and Satisfaction Model-based Instructional Material Motivational Survey in a Computer-based Tutorial Setting. *British Journal of Educational Technology*, 37(2), 243-259.
- Hunicke, R., LeBlanc, M., & Zubek, R. (2004). *MDA: A Formal Approach To Game Design And Game Research*. 19th National Copnference on Artificial Intelligence. San Jose: AAAI Press.
- Keller, J. M. (1983). Motivational Design of Instruction. In R. C. M., *Instructional Design Theories and Models: An Overview of Their Current Status*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Keller, J. M. (1987a). Development And Use Of The ARCS Model Of Instructional Design. *Journal Of Instructional Development*, 10(3), 2-10.
- Keller, J. M. (1987b). Strategies for Stimulating the Motivation to Learn. *Performance & Instruction*, 26(8), 1-7.
- Keller, J. M. (1987c). The Systematic Processof Motivational Design. *Performance & Instruction*, 26(9), 1-8.
- Keller, J. M. (1999). Motivation in Cyver Learning Environments. *International Journal of Educational Technology*, 1, 7-30.
- Keller, J. M. (2010). *Motivational Design for Learning and Performance: The ARCS Model Approach*. New York: Springer.
- Khairuddin, N. S., & Mailok, R. (2020). Pembelajaran Berasaskan Permainan Dalam Mata Pelajaran Sejarah Menggunakan Teknik Mnemonik: Game Based Learning in History Subjects Using Mnemonic Techniques. *Journal of ICT in Education*, 7(1), 9-15.
- Lee, L. -C. & Hao, K. -C. (2015). Designing and Evaluating Digital Game-Based Learning with the ARCS MotivationModel, Humor, and Animation. *International Journal of Technology and Human Interaction*, 11(2), 80-95.
- Li, K. & Keller, J. M. (2018). Use of the ARCS Model in Education: A Literature Review. *Computers & Education*, 122, 54-62.
- Lu, S. -J., Liu, Y. -C., Chen, P. -J., & Hsieh, M. -R. (2018). Evaluation of AR Embedded Physical Game on Students' Learning Achievement and Motivation on Elementary Natural Science. *Interactive Learning Environment*.

- Malone, T. W. (1981). Toward a Theory of Intrinsically Motivating Instruction. *Cognitive Science*, 5(4).
- Malone, T. W. & Lepper, M. R. (1987). Making Learning Fun: A Taxonomy of Intrinsic Motivations for Learning. In R. E. Farr, Aptitude, Learning and Instruction Volume 3: Cognitive and Affective Process Analysis. Mahwah, NJ: Lawrence Erlbaum.
- Mayer, R. E. (2014). *Computer Games For Learning: An Evidence-Based Approach*. Cambridge: MIT Press.
- Mohammad Taufiq, A. G. & Wan Ab Aziz, W. D. (2023). The Impact Of Digital Game-Based Learning Towards Arabic Language Communication. *Jurnal Komunikasi: Malaysian Journal of Communication*, 39(1), 407-424. <https://doi.org/10.17576/JKMJC-2023-3901-23>
- Mohammad Taufiq, A. G., Mahizer, H., Wan Ab Aziz, W. D., & Taj Rijal, M. R. (2022). The Impact Of Mobile Digital Game In Learning Arabic Language At Tertiary Level. *Contemporary Educational Technology*, 14(1), ep344. <https://doi.org/10.30935/cedtech/11480>
- Plass, J. L. & Homer, B. D. (2012). Popular Game Mechanics As Inspirations For Learning Mechanics And Assessment Mechanics. *Game Developer Conference*. San Francisco.
- Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of Game-Based Learning. *Educational Psychologist*(50), 258-283.
- Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of Game-Based Learning. *Educational Psychologist*(50), 258-283.
- Prensky, M. (2001a). *Digital Game-Based Learning*. USA: Paragon House.
- Ryan, R. M. & Deci, E. L. (2000). Intrinsic and Extrinsic Motivations: Classic Definition and New Direction. *Contemporary Educational Psychology*, 25, 54-67.
- Ryan, R. M., & Deci, E. L. (2000a). Self-determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-being. *American Psychologist*, 55(1).
- Salen, K. & Zimmerman, E. (2004). *Rule of Play: Game Design Fundamentals*. Cambridge: MIT Press.
- Sweetser, P. & Wyeth, P. (2005). GameFlow: A Model for Evaluating Player Enjoyment in Games. *ACM Computers in Entertainment*, 3(3), 1-24.
- Travis, N. T. (2018). Design Case: Implementing Gamification with ARCS to Engage Digital Natives. *Journal of Empowering Teaching Excellence*, 2(1), 23-52.
- Wan Daud, W. A. A., Abdul Ghani, M. T., Wong, K. T., & Mohamad Yusof, M. A. (2022). M-Learning: How Well It Works For People Who Are Learning Arabic As A Beginner In Malaysia. *Journal of Positive School Psychology*, 6(5), 5637-5650.
- Woo, J. -C. (2014). Digital Game-Based Learning Supports Student Motivation, Cognitive Success, and Performance Outcomes. *Journal of Educational Technology & Society*, 17(3), 291-307.
- Wu, T. -T. (2018). Improving the Effectiveness of English Vocabulary Review by Integrating ARCS with Mobile Game-Based Learning. *Journal of Computer Assisted Learning*, 1-9.
- Yudaarmagam, B., Melek, C. G., Merdenyan, B., Cikrikcili, O., Salman, Y. B., & Cheng, H. I. (2015). The Effect of Digital Game-Based Learning of Performance and Motivation for HighSchool Students. *ICIC Express Letters*, 9(5).
- Zhang, J. (2013). Chinese Students' Goal Orientation in English Learning: A Study based on Autonomous Inquiry Model. *English Language Teaching*, 7(2), 84-89.