ANALYSIS OF THE ROLE OF GAMIFICATION IN EDUCATION: ITS IMPACT ON STUDENT MOTIVATION

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ABSTRACT

This research examined the role of gamification-based learning in the world of education which has an impact on student learning motivation. The research method used was the survey method, this method was used to collect data and analyze the impact of gamification on student motivation. The subjects of this research were 237 students from East Lampung. The research results showed that the use of gamification can have an impact on students' motivation to learn. Gamification is complemented by game elements such as scores, challenges, and rewards, which can create a more interactive and engaging learning environment and stimulate competitiveness, cooperation, and exploration of complex concepts in a fun way. Rewards associated with gamification provide added value for students to be actively involved in the learning process. This research made an important contribution to understanding the role of gamification in educational contexts and provides a basis for implementing more effective gamification strategies to increase student motivation. The implications of the results of this research can be used as a guide for educators and policymakers to design more interesting and motivating learning experiences in the field of education.

Keywords: *Gamification, Motivation, Education*

1. INTRODUCTION

Current technological advances allow more things to be done, such as learning based on digital learning environments (Majuri et al., 2018). The use of educational technology including situational, discussion-based, and experimental-empirical methods is increasingly common in higher education (Izvorska & Kartunov, 2022). These technologies include computing, extended reality, gaming, and educational tools seen as critical to addressing educational innovation challenges (Espinosa & Cartagena, 2021). Technology makes the learning process easier for educators and students, opens up new opportunities, and changes the educational paradigm as a whole. In this modern era, mastering technology is a necessity to face the rapid development of globalization (Kahar et al., 2021).

The use of technology in education has enabled more interesting and interactive teaching, increased educational accessibility, expanded learning opportunities, and optimized the process of evaluating and monitoring students. Multimedia video-based learning in education in various forms and styles (presentations, tutorials, demonstrations, scenarios, and simulations) is considered one of the most widely adopted and effective learning methods (Christopoulos et al., 2023). Some of the possibilities developed in this digital environment are related to video games to create meaningful and interesting learning experiences, based on this the development of educational games in learning is increasing (Majuri et al., 2018). Games in learning are a mental context that is run using a computer/laptop according to certain rules, using media to further government or corporate training, education, health, public policy, and strategic communication purposes (Alvarez & Damien, 2011).

Games-based learning is a system applied in the educational process, where users can adopt a game for their needs of interest, knowledge, and learning motivation (Vusić & Geček, 2018). Games that are integrated into education are a complex system where learning objectives, rules, and game mechanisms are combined in learning gameplay (Christopoulos et al., 2023). One of the main goals of Serious Games is to provide reliable and cost-effective services in teaching, as well as students gain knowledge in a clearer, more interactive, and realistic way (Ravyse et al., 2017). The effects caused by gamification in education have changed conventional methods, especially in the field of education (Ružic & Dumancic, 2023). Gamification is the application of game elements

in a non-game context, the integration of gamification has shown potential in increasing student motivation and engagement in educational environments (Baah et al., 2023; Dichev & Dicheva, 2017). However, the impact of gamification on learner motivation depends on context and varies between learners. The use of game mechanisms and dynamics can create stronger motivation for students, compared to just extrinsic motivators (Dichev & Dicheva, 2017). Empirical evidence regarding the influence of gamification on learner motivation is limited, and more research is needed to develop a systematic understanding of how to use gamification in educational contexts.

The fact is that in schools, some students come to class to take part in learning without any preparation. Conventional learning methods that are often used do not motivate students and the level of conceptual mastery is low (Hancock, 1994). This usually occurs when educators fail to set clear learning objectives and use traditional teaching methods (Cialdella et al., 2002). Lack of motivation can also be influenced by students' disinterest in the subject matter (Dişlen, 2013). However, highly structured teaching methods have been proven to maximize student motivation (Hancock, 2002). Therefore, educators need to consider the specific learning needs of each learner and use innovative teaching styles to increase motivation. Based on research that has been conducted, it is stated that the use of gamification in learning can increase student motivation, resulting in increased student learning outcomes. However, other research also states that the use of e-learning gamification does not provide a significant increase in students' learning motivation, so further exploration is needed regarding the role of teachers in the learning context (Buckley & Doyle, 2016; Papp, 2017). Based on this, this research will explain the role related to gamification in the field of education concerning students' learning motivation.

2. METHODS

This research was a quantitative descriptive research. The research method used in this research was a survey method. The subjects selected for this research were 237 students at the junior high school (SMP) level in East Lampung who had used gamification in previous learning. The instrument used was a questionnaire with the duration of filling out the questionnaire starting from 10 February 2024 to 25 February 2024. The number of question items available consisted of 20 questionnaires. The procedure in this research included creating a questionnaire related to a predetermined theme, namely the role of gamification in students' learning motivation. The second stage was giving questionnaires to students who have had experience using gamification in learning via Google Forms. The third stage was data processing in the form of making a percentage for each aspect of the questions that have been filled in by students. The fourth stage was interpreting each aspect of the question descriptively. The learning motivation indicators used as a reference to measure the impact of gamification on learning motivation according to Aluja-Banet et al. (2019), shown in Table 1.

Table 1. Indicators of learning motivation

No.	Indicator	Sub Indicator
1.	Speed indicators	Agility Rate
		Time spent
		Transition time
2.	Persistence indicators	Number of logs executed in a given task per day
		Resilience level
		Number of attempts used to submit a given task.
		Persistence level
3.	Intensity indicators	Delivery rate
		Engagement level
		Competitive level

3. RESULTS & DISCUSSION

The research began by creating questionnaire questions related to the theme, namely the role of gamification on students' learning motivation using indicators (Aluja-Banet et al., 2019). The number of question items in each question sub-indicator is two question items. After completing the survey instrument creation, the next step is to distribute the questionnaire to students. Based on the data collection that has been carried out, the results obtained from the questionnaire are shown in Table 2.

Table 2. Percentage of student learning motivation questionnaires

No.	Indicator	Sub indicator	Question number	Answer	Percentage (%)
1.	Speed indicators	Agility Rate	[1]	Yes	82,7%
				No	17,3%
			[2]	Yes	79,4%
				No	20,6%
		Time spent	[3]	Yes	80%
				No	20%
			[4]	Yes	87%
				No	23%
		Transition time	[5]	Yes	78%
				No	22%
			[6]	Yes	82,7%
				No	17,3%
2.	Persistence indicators	Number of logs executed in a given task per day	[7]	Yes	80,1%
				No	19,9%
			[8]	Yes	83%
				No	17%
		Resilience level	[9]	Yes	75%
				No	25%
			[10]	Yes	75%
				No	25%
		Number of attempts used to submit a given task	[11]	Yes	17,3%
				No	86,7%
			[12]	Yes	9,3%
				No	90,7%
		Persistence level	[13]	Yes	81,5%
				No	18,5%
			[14]	Yes	87,5%
				No	12,5%
3.	Intensity indicators	Delivery rate	[15]	Yes	96%
				No	4%
			[16]	Yes	100%
				No	0%
		Engagement level	[17]	Yes	86,7%
				No	13,3%
			[18]	Yes	90,7%
				No	9,3%
		Competitive level	[19]	Yes	86,9%
				No	13,1%

No.	Indicator	Sub indicator	Question number	Answer	Percentage (%)
			[20]	Yes	82%
				No	18%

After obtaining the results as listed in Table 2, then interpret each aspect of the student's answers. The nature of motivation consists of two, namely intrinsic motivation, which can grow from within oneself and is usually known as internal motivation, and extrinsic motivation, which arises from outside a person (Uno, 2023). The speed indicators aspect with the strength rate sub-indicator in question 1 obtained a percentage of 82,7%, while in the second question 79.4% of students answered yes, this states that strength is measured as a sigmoid function of the difference between the dates on which a task was performed. of a subject, for example, science becomes available and the time when students first access the task given. The greater percentage of the aligity rate aspect is considered a positive indicator in the learning process because it indicates that students' interest in learning the material is also higher. In the context of gamification, where game elements are used to increase engagement, engagement levels can include aspects such as how often learners participate in challenges, achieve milestones, or complete assigned tasks. Gamification can help increase the aligity rate by making learning more interesting and providing incentives for students to actively participate in the learning process (Sureephong & Puritat, 2016). In the time spent sub-indicator, the third question received a percentage of 80%, while for the fourth question, 87% of students answered yes. This states that students use the available time to answer questions and complete the challenges given in gamification-based applications well and optimally. Tasks or challenges given with a certain time limit can stimulate students to be more focused and work efficiently to complete the task. can stimulate a spirit of healthy competition and increase motivation to achieve quickly. Therefore, having a specified time spent can stimulate a healthy competitive spirit and increase greater motivation (Barata et al., 2013; Dicheva et al., 2015). In the transition time sub-indicator, the percentage result was 78%, while in the sixth question, 82.7% of students stated that to complete/work on the two different tasks, students needed time to rest from the first task to work on the second task. Students can use the available time gap to prepare themselves before starting to work on the next assignment. The application of gamification must take into account the transition time aspect because students have different learning styles. This diversity ensures that intervention time and other elements can be adapted to suit individual needs, to provide a motivational and effective learning experience (Sholahudin & Yenti, 2022).

The persistence indicator measures the extent to which an individual continues to persist in pursuing a goal, despite difficulties (Aluja-Banet et al., 2019). In the sub-indicator number of logs executed in a given task per day, it was found that the percentage of students who answered yes was 80.1% for the seventh question and 83% for the eighth question. This means that while using gamification in learning, students have several notes related to the learning material during the lesson. Recording material in the form of notes involves information processing and content filtering (Willett et al., 2015). Understanding this kind of material can help students become more actively involved in learning, which can contribute to increased motivation (Papageorgiou, 2021; Tan, 2018). The Resilience level sub-indicator obtained a percentage of 75% for questions nine and ten for students who answered yes. This is because it states that around 75% of students are persistent in completing the tasks given by the teacher in the form of gamification. Previous research stated that the use of gamification increases students' motivation, enjoyment, and encouragement to be serious and collaborate (Tan & Saucerman, 2017). The percentage of the sub-indicator number of attempts used to submit a given task in the eleventh question was 17,3% and 9,3% for the twelfth question. This states that students only collect/submit assignments for each question 1-5 times. Persistence level is the average time spent between consecutive attempts on a given task. Based on the questionnaire, the results were 81,5% and 87,5% for questions thirteen and fourteen. This states that students have high perseverance in completing each task given by the teacher in the form of gamification. The more attempts to collect/collect assignments indicate the level of accuracy and perseverance of students. This is an indicator of motivation, students who are diligent and thorough are committed and try hard to

achieve learning goals (Sahiu & Wijaya, 2017).

Next is the intensity indicators, the delivery rate sub-indicator states that 96% and 100% of students collect and complete the assigned tasks without delay. The high level of participation in collecting and working on assignments shows that the majority of students are willing and able to be actively involved in their assignments. This can be encouraged because the assignments given have been packaged in the form of gamification and if they are late it will automatically be seen by the teacher so that this sub-indicator reflects an increase in intrinsic and extrinsic motivation. Gamification can significantly optimize learning motivation (Sholahudin & Yenti, 2022; Srimuliyani, 2023). The engagement level sub-indicator shows that 86,7% and 90,7% of students feel actively involved in the learning process. This is because gamification, which has many features such as rankings or leaderboards, can encourage students to compete with themselves or friends. This healthy competition can increase the spirit of competition and motivation to achieve better results, so by integrating gamification into learning, students feel more active (Cialdella et al., 2002; Majuri et al., 2018; Ružic & Dumancic, 2023). Research states that gamification elements can increase the motivation and engagement of elementary school and college students (Papp, 2017). Competitive level is a ratio of the total activities carried out by a student in a particular subject, this relates to the most active students on the same day (Aluja-Banet et al., 2019). The research results showed that 86,9% and 82% of students admitted to being more active when learning was carried out using gamification. This is because using gamification presents several elements that were not found in previous learning. Gamification is equipped with reward elements that provide direct recognition or prizes to students for achievements or active participation. The excitement and challenges in gamification learning can create a more positive atmosphere and make students more involved. The findings obtained are relevant to research which shows that gamification can increase the level of student engagement and optimize learning (Smiderle et al., 2020). In addition, several studies show that gamification can increase student motivation and engagement, resulting in better learning outcomes. However, the impact of gamification on motivation and engagement may vary based on specific user characteristics (Azzouz & Gutierrez-Colon, 2020; Baah et al., 2023).

4. CONCLUSION

The research was conducted on junior high school (SMP) students who had gained experience using gamification in learning to identify the impact of gamification on students. The research results show that the use of gamification can have an impact on students' motivation to learn. This is because in learning through gamification students begin to be introduced to the material that will be read with different things at each meeting, thereby reducing boredom in learning. Gamification features game elements such as scores, challenges, and rewards, which can create a more interactive and engaging learning environment and stimulate competitiveness, cooperation, and the exploration of complex concepts in a fun way. Applications that incorporate gamification in learning not only provide a platform for understanding scientific concepts but also encourage students' active participation and stimulate intrinsic motivation, leading to more memorable learning. By integrating game elements into the learning experience, teachers can create an immersive environment that encourages active participation and increases student motivation.

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