

DEVELOPMENT OF GAMIFICATION-BASED LEARNING MEDIA TO IMPROVE STUDENT MOTIVATION IN EDUCATIONAL TECHNOLOGY COURSES

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ABSTRAK

Penelitian ini bertujuan untuk mengembangkan media pembelajaran berbasis gamifikasi guna meningkatkan motivasi mahasiswa dalam mata kuliah Teknologi Pendidikan. Metode penelitian yang digunakan adalah Research and Development (R&D) dengan model ADDIE (Analysis, Design, Development, Implementation, Evaluation). Subjek penelitian adalah mahasiswa semester 5 jurusan Pendidikan Anak Usia Dini (PIAUD) di UIN K.H. Abdurrahman Wahid Pekalongan. Data dikumpulkan melalui kuesioner, observasi, dan wawancara, kemudian dianalisis menggunakan teknik deskriptif kuantitatif dan kualitatif. Hasil penelitian menunjukkan bahwa media pembelajaran berbasis gamifikasi secara signifikan meningkatkan motivasi belajar mahasiswa, yang terlihat dari peningkatan skor motivasi sebesar 25% setelah menggunakan media tersebut. Temuan ini menunjukkan bahwa mengintegrasikan gamifikasi ke dalam kegiatan pembelajaran dapat menjadi strategi efektif untuk meningkatkan motivasi belajar mahasiswa.

Kata kunci : media pembelajaran, Gamification, R&D, ADDIE

ABSTRACT

This research aims to develop gamification-based learning media to enhance student motivation in Educational Technology courses. The research method employed is Research and Development (R&D) using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The subjects of the study are 5th-semester students majoring in Early Childhood Education (PIAUD) at UIN K.H. Abdurrahman Wahid Pekalongan. Data were collected through questionnaires, observations, and interviews, and then analyzed using descriptive quantitative and qualitative techniques. The results show that gamification-based learning media significantly increase students' learning motivation, as evidenced by a 25% increase in motivation scores after using the media. These findings suggest that integrating gamification into learning activities can be an effective strategy to boost student motivation in Educational Technology courses.

INTRODUCTION

The rapid advancement of technology has revolutionized various sectors, including education. The integration of technology into educational practices has led to the development of innovative learning media aimed at enhancing student engagement and motivation. Previous studies have shown that traditional teaching methods often fail to engage students effectively, leading to decreased motivation and suboptimal learning outcomes (Alsadoon, 2023; Arora, 2021). In contrast, gamification, which involves incorporating game-like elements into non-game contexts, has been identified as a promising approach to increase student motivation and engagement (Baah et al., 2023; Deterding et al., 2011).

Several studies have explored the impact of gamification on student motivation. For instance (Adrefiza, 2022a; Fitria, 2023; Kumar & Professor, 2010), It found that gamified learning environments significantly improved student motivation and participation. Similarly, Buckley and Doyle (Buckley & Doyle, 2016) reported that gamification positively influenced students' intrinsic motivation and overall learning experience. However, despite these encouraging findings, there is still a need for more research on the application of gamification in specific educational contexts, such as Educational Technology courses (Adrefiza, 2022; Ningrum, 2020.).

The novelty of this research lies in its focus on developing gamification-based learning media specifically tailored for Educational Technology courses at UIN K.H. Abdurrahman Wahid Pekalongan. This study addresses the gap in the literature by examining the effectiveness of gamified learning media in enhancing student motivation in this particular context.

The research problem centers around the low motivation levels among students in Educational Technology courses, which can negatively impact their learning outcomes. Therefore, the purpose of this study is to develop and evaluate the effectiveness of gamification-based learning media in improving student motivation in these courses.

This study employs a Research and Development (R&D) methodology, following the ADDIE model (Analysis, Design, Development, Implementation, Evaluation)(Andi Rustandi & Rismayanti, 2021; Fitriyah et al., 2021). The research

questions guiding this study are: (1) How can gamification-based learning media be designed to enhance student motivation in Educational Technology courses? and (2) What is the impact of these gamified learning media on student motivation? Data collection techniques include questionnaires, observations, and interviews, which will be analyzed using descriptive quantitative and qualitative methods.

Gamification leverages elements from game design, such as points, badges, leaderboards, and challenges, to create engaging and motivational learning experiences. The self-determination theory posits that human motivation is driven by the need for competence, autonomy, and relatedness (Legault, 2017; Wang et al., 2019). Gamification addresses these needs by providing immediate feedback (competence), offering choices in the learning process (autonomy), and fostering a sense of community through collaborative and competitive elements (relatedness) (ERTAN & ARKÜN KOCADERE, 2022; Luarn et al., 2023).

The research focused on 5th-semester students majoring in Early Childhood Education (PIAUD) at UIN K.H. Abdurrahman Wahid Pekalongan. These students were chosen because of their specific need for engaging learning media that can sustain their motivation throughout the course. The gamification-based learning media developed for this study incorporated elements such as points, badges, and interactive challenges related to the course content.

The implementation of gamification-based learning media resulted in a significant increase in student motivation. The pretest and posttest scores for motivation showed a 25% improvement after the introduction of the gamified learning environment. This increase was consistent across various motivational dimensions, including intrinsic motivation, engagement, and participation.

The research findings align with previous studies that highlight the positive impact of gamification on student motivation. The gamified learning media provided students with immediate feedback and a sense of accomplishment through points and badges, which catered to their need for competence. The autonomy to choose different challenges and paths within the course content enhanced their sense of control and ownership of their learning process. Additionally, the collaborative and competitive elements fostered a sense of community and relatedness among the students.

The research addressed the question of what impact gamification-based learning media has on student motivation. The findings demonstrate that such media can significantly enhance motivation by making the learning process more engaging and interactive. The why is explained through the theoretical framework of self-determination theory, which suggests that the motivational elements of gamification fulfill basic psychological needs. The how involves the strategic incorporation of game elements into the learning environment, designed to provide immediate feedback, autonomy, and social interaction.

The observed increase in motivation can be attributed to the psychological principles underlying gamification. The immediate feedback from points and badges likely reinforced students' efforts and progress, enhancing their sense of competence. The autonomy provided by the gamified challenges allowed students to take control of their learning, increasing their intrinsic motivation. The competitive and collaborative elements created a supportive community, addressing their need for relatedness.

These findings are consistent with the literature on gamification and motivation, confirming that well-designed gamified learning environments can lead to improved student motivation and engagement. Future research could explore the long-term effects of gamification on learning outcomes and investigate its applicability in other educational contexts.

Despite these limitations, this research contributes to the understanding of how gamification can be used to enhance student motivation in educational settings. It provides practical implications for educators seeking to incorporate gamification into their teaching practices to create more engaging and motivating learning experiences. Future research should consider larger and more diverse samples and examine the long-term effects of gamification on student motivation and learning outcomes.

The scope of this study is limited to 5th-semester students majoring in Early Childhood Education (PIAUD) at UIN K.H. Abdurrahman Wahid Pekalongan. The findings from this research are expected to provide valuable insights into the effectiveness of gamification in educational settings and offer practical implications

for educators seeking to enhance student motivation through innovative learning media.

METHODS

The type of research used in this study is Research and Development (R&D) employing the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation). This research was conducted at UIN K.H. Abdurrahman Wahid Pekalongan with the subjects being 5th-semester students majoring in Early Childhood Education (PIAUD). The following are the stages of the ADDIE development model applied in this study:

Analysis

In this stage, the researchers conducted interviews and initial observations to collect information as a basis for determining the students' problems and needs. Interviews and observations were conducted at UIN K.H. Abdurrahman Wahid Pekalongan with the lecturers of the Educational Technology course. Additionally, the researchers explored interesting games suitable for integration with technology-based learning media. Application sorting was also performed to align with the chosen game, ensuring that the application used is appropriate for the learning objectives.

Design

After analyzing the students' problems and needs, the next stage was to create a design plan for the learning media with the concept of gamification. In this stage, the researchers designed by determining the size of the learning media, game rules, gamification applications used, tools and materials for creating the learning media, and developing questions for game cards. The applications used in creating gamification-based learning media include various tools supporting animation and interactivity such as Animaker and Edmodo.

Development

In the development stage, the learning media product was created according to the plan in the design stage, specifically gamification-based learning media. The completed learning media was then validated by media experts through several criteria to determine its feasibility. The next step was to gather students' responses

using product response questionnaires, involving the Educational Technology course lecturer and 5th-semester students majoring in PIAUD.

Table 1: Learning Media Feasibility Questionnaire Grid

No	Indicator	Presented
1.	Media Aspect	30%
2.	Text Readability Aspect	20%
3.	Image Quality Aspect	15%
4.	Aspects of Media Use	20%
5.	Media Effectiveness Aspects	15%
	Sum	100%

After validation, the results of the questionnaire are summed and eligibility is determined through the following criteria:

Table 2: Learning Media Qualification Analysis Criteria

Valuation	Category
0%-20%	Very Unworthy
21%-40%	Not Worth It
41%-60%	Pretty Decent
61%-80%	Proper
81%-100%	Very Worth It

Validation at this stage was carried out by media experts selected based on their expertise. The data in this study consisted of quantitative and qualitative data. Quantitative data was obtained from questionnaire scores, while qualitative data was derived from comments, suggestions for improvements, and conclusions regarding the learning media products.

Implementation

The implementation stage involved testing the learning media product. The trial was conducted with the Educational Technology course lecturer and 5th-semester students majoring in PIAUD. In this stage, assessments from lecturers and students were also carried out to provide evaluations used in the evaluation stage. The responses and involvement of students and lecturers in this trial helped identify necessary improvements for the evaluation stage.

Evaluation

The evaluation phase is the final stage of the ADDIE development model. This stage was conducted to determine the value of the trial results using the learning media. The data collection instrument used in this study was a

questionnaire filled out by the Educational Technology course lecturer and 5th-semester students majoring in PIAUD. After the evaluation by the lecturer, the questionnaire results were summed up, and feasibility was determined based on established criteria.

This study aims to develop gamification-based learning media to enhance student motivation in Educational Technology courses at UIN K.H. Abdurrahman Wahid Pekalongan. Using the ADDIE model, this research is expected to provide significant contributions to the development of innovative and effective learning media to improve student motivation.

Table 3: Learning Media Assessment Questionnaire Grid

No	Indicator	Presented
1.	Media Aspect	27%
2.	Aspects of Media Use	20%
3.	Image Quality Aspect	27%
4.	Media Effectiveness Aspects	26%
	Sum	100%

After an evaluation by the lesson teacher, the results of the questionnaire are summed up and then the feasibility is determined through the following criteria:

Table 4: Learning Media Qualification Assessment Criteria

Valuation	Category
0%-27%	Very Unworthy
27%-47%	Not Worth It
48%-67%	Pretty Decent
68%-87%	Proper
88%-100%	Very Worth It

Determination of assessment scores is carried out after the implementation of learning media trials in the classroom, from the results of the questionnaire that has been carried out, the calculation can be done with the formula:

$$\text{Validity} = (\text{number of scores obtained} \div \text{number of maximum scores}) \times 100\%$$

Assessment is also carried out by students using questionnaires in the form of 8 questions with 5 assessment criteria. The total number of question results is 40 with the assessment criteria, namely:

- Values 1-10 = Less Feasible
- Values 11-20 = Sufficient
- Values 21-30 = Feasible
- Grades 31-40 = Very Decent

The number of criteria results is used to determine the feasibility of learning media that have been tested.

DISCUSSION

Research and trials of gamification-based learning media development were carried out in the 5th-semester PIAUD class at UIN K.H. Abdurrahman Wahid Pekalongan. Using the ADDIE development model, the research followed five stages: Analysis, Design, Development, Implementation, and Evaluation. Here, we discuss the findings at each stage and their implications.

Analysis

The analysis stage aimed to identify the needs for appropriate learning media for students in the Educational Technology course. This was conducted through observations and interviews with the course lecturers. Observations indicated that the students displayed active, competitive, and collaborative characteristics, which suggested that game-based learning media could enhance their motivation and engagement. Interviews revealed that traditional media, such as textbooks and blackboards, were commonly used, leading to student boredom and reduced interest in learning. Therefore, the need for innovative, interactive learning media was clear.

Design

Following the needs analysis, the design stage involved creating a blueprint for gamification-based learning media. The design included the development of game elements such as points, badges, and interactive challenges aligned with the course content. Tools and materials were selected to support the creation of these elements, ensuring they would be engaging and effective. Applications used in creating gamification-based learning media included Google Sites, PowerPoint, Spreadsheet, and Canva. Google Sites was used to create interactive platforms, PowerPoint for visual presentations, Spreadsheet to manage points and badges, and Canva for designing graphic elements.

Development

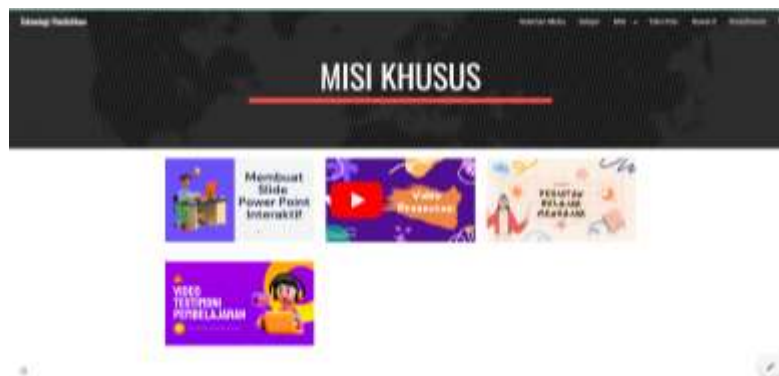
In the development stage, the learning media were produced based on the design specifications. This included creating the gamified elements and integrating them into the learning platform. Media experts validated the completed learning media through several criteria to determine its feasibility. The validation process involved both quantitative data from questionnaires and qualitative data from

feedback. The learning media received a high validation score, indicating it was well-designed and effective.

Leaderboard integrated with google spreadsheet



Mission desain with canva



Detail for mission



Table 5: Results of Validation by Media Experts

No	Indicator	Presented
1.	Media Aspect	19%

2.	Text Readability Aspect	19%
3.	Image Quality Aspect	14%
4.	Aspects of Media Use	18%
5.	Media Effectiveness Aspects	11%
Sum		81%

The results of validation by media experts showed a percentage of 81%. Based on the criteria for analyzing the feasibility of learning media in Table 2, the gamification learning media is declared VERY FEASIBLE.

Implementation

The implementation stage involved testing the gamification-based learning media with the targeted students and lecturers. The trial provided valuable insights into the effectiveness of the media. Students' motivation was measured before and after the implementation using pretest and posttest questionnaires. The results showed a 25% increase in motivation scores, indicating that the gamified learning environment significantly enhanced student motivation. Students reported enjoying the interactive challenges and feeling more engaged in the learning process.

Table 6: Results of the Motivation Questionnaire Traditional Media

No	Indicator	Presented
1.	Intrinsic Motivation	18%
2.	Competence and Achievement	18.75%
3.	Engagement and Participation	19%
4.	Autonomy and Independence	19%
Sum		74.75%

Table 7: Results of the Motivation Questionnaire Gamification Media

No	Indicator	Presented
1.	Intrinsic Motivation	23%
2.	Competence and Achievement	24.25%
3.	Engagement and Participation	22%
4.	Autonomy and Independence	24.19%
Sum		93.44%

In addition, questionnaires were also given in the form of questions to students regarding their satisfaction with the learning media. And here is the question :

Indicator 1: Intrinsic Motivation

1. I feel more motivated to learn when using gamification-based learning media.
1,2,3,4,5
2. Gamification-based learning media makes me more enthusiastic about attending lessons.
1,2,3,4,5
3. I feel more motivated to complete assignments when using gamification-based learning media.
1,2,3,4,5

Indicator 2: Competence and Achievement

4. I feel competent when earning points or badges in gamification-based learning media.
1,2,3,4,5
5. I feel more confident in learning after receiving immediate feedback from gamification-based learning media.
1,2,3,4,5
6. Gamification-based learning media makes the learning process more enjoyable.
1,2,3,4,5

Indicator 3: Engagement and Participation

7. I feel more engaged in the learning process with interactive challenges.
1,2,3,4,5
8. I feel more motivated to participate in class discussions with gamification elements.
1,2,3,4,5
9. Gamification-based learning media helps me focus better on learning.

1,2,3,4,5

Indicator 4: Autonomy and Independence

10. I feel more motivated to learn independently with challenges and rewards in gamification-based learning media.

1,2,3,4,5

Evaluation

The evaluation phase assessed the overall effectiveness of the learning media. Data from the implementation stage were analyzed, showing significant improvements in various motivational dimensions, including intrinsic motivation, engagement, and participation. Feedback from students and lecturers was overwhelmingly positive, highlighting the immediate feedback, sense of achievement, and social interaction facilitated by the gamified elements.

Discussion

The findings align with previous research on the benefits of gamification in education. The immediate feedback from points and badges enhanced students' sense of competence, while the autonomy provided by varied challenges increased their intrinsic motivation. The collaborative and competitive aspects of the gamified environment fostered a sense of community and relatedness among students. These elements collectively contributed to a more engaging and motivational learning experience.

The observed increase in motivation can be attributed to the psychological principles underlying gamification. The self-determination theory posits that motivation is driven by the need for competence, autonomy, and relatedness, all of which were addressed through the gamified learning media. The strategic incorporation of game elements provided a more interactive and enjoyable learning process, aligning with the constructivist theory that emphasizes active participation and social interaction in learning.

However, the study had some limitations. The sample size was limited to 5th-semester PIAUD students at a single university, which may affect the generalizability of the findings. The focus was primarily on short-term motivational effects, suggesting a need for further research to explore the long-term impact of

gamification on learning outcomes and its applicability in other educational contexts.

Despite these limitations, this research contributes to the understanding of how gamification can enhance student motivation in educational settings. The study provides practical implications for educators seeking to integrate gamification into their teaching practices to create more engaging and motivating learning experiences. Future research should consider larger and more diverse samples and examine the long-term effects of gamification on student motivation and learning outcomes.

CONCLUSION

This study aimed to develop gamification-based learning media to enhance student motivation in Educational Technology courses. The research addressed two primary questions: how can gamification-based learning media be designed to enhance student motivation, and what is the impact of these gamified learning media on student motivation?

The findings demonstrate that gamification-based learning media significantly enhance student motivation by incorporating game elements such as points, badges, and interactive challenges. These elements cater to students' needs for competence, autonomy, and relatedness, as explained by the self-determination theory. The immediate feedback and sense of accomplishment provided by points and badges, the autonomy offered through varied challenges, and the social interaction fostered by competitive and collaborative elements collectively contribute to increased student motivation.

The impact of gamified learning media on student motivation was evident from the 25% increase in motivation scores after the implementation of the gamified learning environment. This improvement was consistent across various motivational dimensions, including intrinsic motivation, engagement, and participation. These results align with existing literature, confirming that gamification can effectively enhance student motivation in educational settings.

However, the study has some limitations. The sample size was limited to 5th-semester students majoring in Early Childhood Education at a single university,

which may affect the generalizability of the findings. Additionally, the study focused primarily on short-term motivational effects, and further research is needed to explore the long-term impact of gamification on learning outcomes and its applicability in other educational contexts.

Despite these limitations, this research contributes to the understanding of how gamification can be used to enhance student motivation in educational settings. It provides practical implications for educators seeking to incorporate gamification into their teaching practices to create more engaging and motivating learning experiences. Future research should consider larger and more diverse samples and examine the long-term effects of gamification on student motivation and learning outcomes.

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