

# Exploring the Opinions of Mathematics Teacher Candidates Regarding the Usage of Gamified Digital Education Platform “Dersigo”

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## Abstract

In the present day, as technology merges with education, various tools, and applications are widely used in both classroom and outside learning experiences. In this context, in Turkey as well, a digital education application named "DERSİGO" aims to reach students by adopting a fully immersive learning model and a gamified approach. DERSİGO is an innovative educational platform offering visually supported topic explanations, content from question to topic, educational videos, and other supportive learning materials. The use of this educational application is increasingly gaining attention. The purpose and importance of this research are to examine how the digital education application named DERSİGO is evaluated by pre-service mathematics teachers and to understand the advantages that the use of this application for educational purposes can provide for students. The positive evaluation of the digital education application DERSİGO by pre-service Mathematics teachers shows that such technology-based education tools can potentially play a valuable role in the education process. This study examined the views of Mathematics teacher candidates regarding the educational use of the paid application DERSİGO. The research was conducted with the participation of 27 Mathematics teacher candidates, who were provided with access codes to experience Mathematics lessons and the gamification process within the DERSİGO application. The data collected from the participants were obtained through a semi-structured student opinion form and analyzed using the content analysis method. According to the findings of the study, teacher candidates express that the educational use of DERSİGO can make Mathematics lessons more engaging and fun, increase student participation, teach lesson content through gamification, boost student motivation, enable assessment of student performance, and assist in reinforcing learned subjects. A significant portion of the teacher candidates states that the DERSİGO application can be effectively used in mathematics education, while some teacher candidates emphasize its suitability for non-mathematics verbal subjects. The research reveals that DERSİGO can offer students advantages such as increasing class participation, improving student interaction, reinforcing learning processes, and increasing student motivation. Based on the obtained findings, various recommendations are provided for researchers and educators.

**Keywords:** gamified instruction, The DERSİGO Application, mathematics education, teacher candidates

## 1. Introduction

Especially due to the rapid integration of mobile devices into our daily lives, harnessing the positive effects of the relationship between technology and individuals and benefiting from it plays a significant role in educational processes. In this context, there is a need for educational software or applications targeting the new generation of students, aiming to enhance student participation and motivation in classes and to make the learning content and design up to date. With the swift development and progress of technology, the concept of gamification has become crucial in education. Considering the close relationship of the current generation with technology, it is believed that integrating the concept of gamification with technology will enhance its motivating effects when used in the educational process. Technology integration is especially regarded as an effective method to motivate Generation Z students during the teaching process (Johns, 2015). Digital games and social networks hold a significant place in the lives of Generation Z students (Cakiroglu et al., 2017).

Gamification refers to the use of game elements and principles to capture students' interest, solve problems, and make teaching more effective, efficient, and engaging. Deterding, Dixon, Khaled, and Nacke (2011) define gamification as the use of game design elements in non-game contexts. In education, gamification can be defined as the incorporation of game elements into education to enhance students' motivation, achievement, interest in the subject, and attitudes toward learning (Yildirim, 2016). However, according to Yildirim and Demir (2014), gamification in education has faced criticism due to potential conflicts with educational theories and the possibility of driving learners into competition. Yet,

the competition mentioned here refers to a competition with oneself rather than among students. According to Karamert (2019), gamification creates environments where students can explore knowledge.

Gamification in education can be applied in individual or collaborative work and student assessment processes. Through this approach, independent learning, collaborative learning, and problem-solving skills can be promoted. Cin (2022), in their thesis, found that math lessons taught through gamification were interesting and fun, the games played helped reinforce what students learned, and they were instructive.

The advancement of educational technology has also made gamification methods applicable to digital platforms. Currently, numerous digital tools, environments, and applications are available to achieve this goal. Within the realm of education, gamification represents an educational platform that can create a learning environment at any moment needed throughout one's life (Gokkaya, 2014).

Ipek, Gozum, Papadakis, St., & Kalogiannakis (2023) reviewed the literature to reveal the potential effects of ChatGPT on education. This study explains potential implications, possibilities, and concerns regarding the use of ChatGPT in education as indicated in the literature. The results of this research were examined under themes according to the positive and negative aspects of ChatGPT. Additionally, Karakose, Demirkol, Aslan, Kose and Yirci (2023) discussed the effect of artificial intelligence on education and training processes in their research. However, another study concluded that ChatGPT is a promising tool that can support the scientific research process in collaboration with human intelligence and that newer versions of these chatbots can be developed in such a way that they can be integrated into different stages of scientific work ethically and safely. The researchers' aim in another study was to create an adaptive gamification framework based on specific motivational and psychological theories, integrating adaptive criteria, educational strategies, game elements, and all important aspects of the physics education learning process (Zourmpakis, Kalogiannakis & Papadakis, 2023). In various scientific fields, including education, there is a significant emphasis on utilizing gamification to enhance motivation and engagement. In this context, Papadakis, Zourmpakis & Kalogiannakis (2023) developed a gamification environment centered on self-directed and problem-based learning. This environment encompassed a comprehensive learning process related to the concept of coagulation within a science lesson. The study was conducted with a small sample of 5th-grade students to gain insights into their perspectives on this approach. The findings yielded promising results in terms of improved learning outcomes, heightened motivation, and increased student engagement. Additionally, it sheds light on students' perceptions of the motivational aspects of gamification elements and their willingness to continue learning in similar gamified environments. Despite certain limitations, this study contributes valuable insights to the relatively limited body of research on gamification in science education

One of these educational platforms is DERSİGO. DERSİGO is an online digital education platform designed with a gamified and innovative educational system. It can be accessed through various hardware devices such as smartphones, laptops, tablets, and desktop computers. Built based on a comprehensive learning model, the DERSİGO digital education platform, guided by the smart assistant İGO, gets to know students personally, identifies their areas of deficiency, and assigns specific tasks to ensure their complete learning. During this process, students could watch visually supported instructional videos at their own pace and location, and they can also take notes directly on the lesson videos. The summary videos that transition from questions to topics teach students how to apply the knowledge to questions. Additionally, students can participate in the gamified and innovative educational system's competition named "Meta League," engaging in battles and knowledge competitions, thus experiencing a competitive environment. By completing tasks, students earn points and diamonds, allowing them to climb to higher leagues in the Meta League and use the earned diamonds in the application store.

With a flexible study schedule tailored for each student, they can effectively manage their time and concentrate on the subjects identified by the artificial intelligence as lacking. Simultaneously, they can participate in practice exams to monitor their progress in real time and observe their gradual advancement toward their goals.

This study is one of the limited research efforts that focus on evaluating the digital education application "DERSİGO" by Mathematics teacher candidates and examining the specific advantages and limitations of such applications in Mathematics education. Therefore, this study provides a new perspective to the literature by delving more deeply into teacher candidates' perceptions and experiences with digital educational tools to fill a research gap in this area. In the current literature, there are limited studies on how pre-service mathematics teachers evaluate digital education applications, especially applications such as DERSİGO, which include a full learning model and gamification elements. This deficiency can be stated as one of the main motivations of the research. The objectives of the research are; To evaluate how the DERSİGO application contributes to the learning experiences of pre-service Mathematics teachers, to examine how the DERSİGO application contributes to teaching Mathematics lessons more interestingly and effectively, to understand the opinions of pre-service teachers about the usability of the DERSİGO application in education and as an effective learning tool, to understand the opinions of pre-service teachers about the usability of the DERSİGO application

in education and as an effective learning tool, to evaluate the effects of the DERSİGO application on the students of pre-service Mathematics teachers. We can say that it is to evaluate how it affects student participation, student motivation, and student performance, and to examine which learning strategies the DERSİGO application encourages and what learning results it provides to pre-service Mathematics teachers. These objectives reflect the focus of the research and the areas in which it aims to contribute to the literature.

This research addresses several contemporary issues, including the use of digital education applications, gamification, student motivation, interdisciplinary effects, and education policies. These are essential areas of focus for researchers and educators in the field of education.

**Use of Digital Education Applications:** With the integration of technology into education, the increasing use of digital education applications both inside and outside the classroom presents challenges for educators and students. This challenge is closely linked to the need for a better understanding of the pedagogical effects of digital education applications.

**Gamification and Education:** Studies on the impact of gamification features in digital education applications on teaching and learning are of paramount importance in the field of education. While this study explores how gamification can affect student motivation, participation, and learning, there is room for more in-depth research into the pedagogical aspects of gamification.

**Interdisciplinary Use of Digital Learning Tools:** Some teacher candidates suggest that "DERSİGO" is suitable for Mathematics, while others argue it is more appropriate for verbal subjects. This raises a discussion about how digital learning tools can be effectively utilized across different disciplines and which subjects they are best suited for.

**Student Motivation and Participation:** Enhancing student motivation and participation through digital education applications is a significant educational challenge. While this study touches on the topic, further investigation into how digital tools can be effectively employed to increase student motivation and participation in broader contexts is needed.

**Educational Technologies and Education Policies:** The use of educational technologies both inside and outside the classroom has implications for education policies and guidelines. Research in this area can provide insights into how such applications can align with educational policies.

These contemporary issues highlight the complex landscape of digital education applications, their impact on teaching and learning, and their alignment with education policies. Researchers and educators can benefit from exploring these areas to improve the integration of technology in education and enhance the overall learning experience for students.

This study, which examines the opinions of prospective mathematics teachers regarding the usage of DERSİGO, an online platform aligned with their educational objectives, has motivated us to assess the valuable features offered by the application. DERSİGO Application: <https://www.dersigo.com/>

### *1.1 Research Objective*

The purpose of this article is to examine the role of various tools and applications commonly used to enhance learning experiences in today's education integrated with technology. In this context, the focus is on the digital education application named "DERSİGO" in Turkey, which adopts a comprehensive learning model and a gamified approach for students. DERSİGO is an educational platform that offers innovative content such as visually supported topic explanations, transitioning from questions to topics, and educational videos. This study aims to investigate the perspectives of mathematics teacher candidates regarding the usage of the online application DERSİGO for educational purposes. The study involved 27 mathematics teacher candidates who experienced the DERSİGO application. Subsequently, the collected data were evaluated using content analysis through a semi-structured student opinion form.

### *1.2 Significance of the Research*

This study holds great significance in an era where the use of technology and gamified teaching methods is increasingly prevalent in the field of education. Especially considering digital education platforms like DERSİGO, which are designed to enrich student's learning experiences and present them engagingly and effectively, understanding the effects of such applications in critical areas such as enhancing student motivation, making the learning process more effective, and evaluating student achievement is of utmost importance.

Examining the perspectives of mathematics teacher candidates provides insights into how these future teachers might incorporate educational technologies into their teaching careers. Gaining an understanding of how such applications can be integrated into student education, how teachers are prepared, and how learning materials are created contributes to supporting sustainable and effective developments in the field of education.

Furthermore, this study provides valuable data on how technology integration in education affects fundamental factors such as student engagement, student motivation, instructional effectiveness, and student achievement. These data can

assist educators and decision-makers in shaping education policies, curriculum designs, and teaching approaches. In conclusion, this study offers a valuable contribution by helping us understand the impacts of technology use in education and enhancing educational processes for more effectiveness.

## 2. Method

### 2.1 Participant Characteristics

The sample of this study consists of fourth-year students majoring in mathematics education at the undergraduate level. Participants were selected using a convenient sampling method. The research was conducted with a group of students at a state university. Within the scope of the study, it was determined that two teacher candidates were already familiar with and had used the DERSİGO application.

The demographic characteristics of the participants are detailed in Table 1. Moreover, as seen in Table 1, the study group consists of 17 female and 10 male teacher candidates. Additionally, all participating teacher candidates possess smartphones.

Table 1. Demographic Information of Participants

	<b>f</b>
<b>Owning a smartphone</b>	
<i>Yes</i>	27
<i>No</i>	0
<b>Having mobile internet</b>	
<i>Yes</i>	25
<i>No</i>	2
<b>Gender</b>	
<i>Female</i>	17
<i>Male</i>	10

### 2.2 Instruments

The study was conducted using a qualitative research approach, aiming to determine the perspectives of mathematics teacher candidates regarding DERSİGO, which was designed with educational objectives. Qualitative research allows participants to express themselves and provide researchers with richer and deeper data. Such research is important for improving educational policies and practices, improving teacher preparation programs, and supporting the professional development of teacher candidates. This type of research is used to gain a deeper understanding of participants' thought processes, experiences, and emotional responses. Qualitative research approaches allow participants to express themselves and provide in-depth insights to researchers.

### 2.3 Data Collection Procedures

In our study, we employed in-depth interviews, a qualitative research method, to understand the viewpoints and experiences of teacher candidates. We conducted one-on-one interviews with 27 mathematics teacher candidates. Throughout the study, we introduced participants to the DERSİGO application and encouraged them to explore its gamification strategies. To gauge the teacher candidates' perspectives conclusively, we devised a semi-structured opinion form. This form was carefully crafted with expert input and underwent necessary adjustments before being employed in the research.

The semi-structured interview form serves as a valuable tool for researchers seeking to explore specific topics or gain insights into participants' thoughts and opinions. This type of interview form provides a structured framework while also allowing participants some flexibility. By employing semi-structured interview forms, we were able to delve into particular subjects and extract profound insights and perspectives from the participants. This approach enhanced the organization of our research process and facilitated more effective management of data collection.

At the outset of the interview form, we explained the research's title and objectives. This information helped participants prepare adequately for the interview. We initiated data collection by gathering basic demographic information from participants, such as age, gender, occupation, and education level. This demographic data aided us in gaining a deeper understanding of the participants' characteristics.

The semi-structured interview form included questions meticulously designed to address specific topics or key inquiries, aligning with our research's focal points. Participants were encouraged to express their thoughts and opinions on these

subjects. We ensured logical coherence by arranging the questions in a sequential order.

These semi-structured interview forms permitted participants to freely articulate their perspectives while responding to specific queries. This approach enabled us to obtain more comprehensive and personalized insights. Some questions even offered response options to assist participants in articulating their viewpoints, such as "disagree," "agree," or "undecided."

Lastly, we extended our gratitude to the participants within the interview form, acknowledging their valuable contributions, and shared the researcher's contact information.

#### 2.4 Data Analysis

Before starting the analysis of the collected data, the written notes obtained from the interviews were converted into text. This step is very important as it converts the texts into a format that can be easily analyzed. To fully understand the content of the interview, the answers given to the forms were read many times, and notes were taken. Data sections were systematically labeled and categorized according to their content. In this way, meaningful information units such as sentences or paragraphs were defined, and codes were assigned to them. Codes were created inductively, meaning they were derived from the data itself rather than predetermined.

The answers given by the pre-service teachers through the data collection tool were analyzed using the content analysis method. During the qualitative data analysis process, numeric descriptors (TC1, TC2, etc.) were given to prospective teachers and they were arranged under a certain numbering system. During the analysis process, two researchers created categories and themes. In this context, both researchers gave codes to the student responses and then these codes were grouped into sub-themes.

The responses from the data collection tool were used to calculate the inter-coder reliability scores using the formula developed by Miles and Huberman (1994). In this context, the reliability score was determined as 85%. For validity purposes, direct quotations are included in the presentation of the findings. Evaluations were made to determine the reasons for these differences regarding the conflicting situations and the results were shared.

### 3. Results

The obtained research results have been organized according to the research questions, and the findings regarding the viewpoints of mathematics teacher candidates towards the DERSİGO application have been presented. Following the analysis of the teacher candidates' viewpoints, three main themes were identified: advantages, usability, and issues. Detailed information related to these themes has been sequentially and comprehensively provided.

The advantages of using DERSİGO in line with educational objectives, as perceived by mathematics teacher candidates, have been categorized under learning outcomes and instructional process. The coded data and frequency details for these categories are presented in Table 2.

Table 2. Opinions of Pre-service Mathematics Teachers on the Advantages of Using DERSİGO in Line with Educational Goals

	<b>f</b>
<b>Learning Outcomes</b>	
Quick thinking skills	8
Comprehension skills	7
Active participation in class	21
<b>Teaching Process</b>	
Gamification and Competition	23
Topic review and Reinforcement	12
Preparing for the class	8
Competition	17
Engaging and enjoyable experience	9
Assessment	13

The analysis of Table 2 reveals that participating teacher candidates perceive the use of DERSİGO in alignment with educational objectives as making lessons more engaging and enjoyable. They express that it could enhance students' participation in class, elevate motivation through game and competition elements within the lessons, and aid in reinforcing

learned topics. A significant portion of mathematics teacher candidates highlight the most prominent advantage of DERSİGO being its ability to enhance positive emotional experiences (excitement, interest, etc.). For instance, the candidate (TC17) states, "I think it's a very engaging application for students. It will prevent students from getting bored during class." Candidate (TC5) articulates their thoughts with, "It makes math more attractive and arouses participation desire in students. Therefore, I believe it can enhance achievement."

Some teacher candidates also emphasize the effectiveness of DERSİGO activities in refreshing previously learned information and solidifying new knowledge. For instance, the candidate (TC7) finds it beneficial for revision purposes, stating, "I find its repeated use useful." Moreover, many participating teacher candidates express that DERSİGO transforms mathematics instruction into an enjoyable learning experience. Their perspectives are summarized as follows: Candidate (TC16) states, "Mathematics has always been challenging for students. Thanks to this application, math is presented in a fun way." Candidate (TC19) notes, "Being a different learning method, it's quite enjoyable to acquire knowledge this way." Candidate (TC22) believes, "I think it makes learning easier and makes the lesson more enjoyable. This could increase students' interest in the subject."

Additionally, certain teacher candidates in the study mention that DERSİGO activities could help students come to class more prepared. For example, candidate (TC27) suggests, "The application could help students come to class already prepared, thus aiding them in addressing any deficiencies related to the topic before the lesson."

Some teacher candidates in the study also point out that DERSİGO's gamified competitive environment could increase class participation. For instance, candidate (TC8) shares, "The competitive format carries an exciting element. This could encourage greater student participation in class."

In this context, some teacher candidates mentioned that DERSİGO activities provide them with the opportunity to assess students' knowledge levels. Candidate (TC2), who expressed this viewpoint, stated, "Students can see where they are successful and where they have deficiencies."

The opinions of participant teacher candidates reflect that the use of DERSİGO aligns with educational goals and makes lessons more engaging and enjoyable. Additionally, it is noted that students can participate more actively in class, and the inclusion of game and competition elements within the lessons can boost student motivation and aid in reinforcing learned concepts. Many mathematics teacher candidates emphasize that DERSİGO can enhance positive emotional experiences (excitement, interest, etc.), thereby preventing students from becoming bored during lessons. Specifically, it is expected to make mathematics more appealing and stimulate student participation. Some teacher candidates have expressed that DERSİGO activities are effective in reminding students of previously learned information and reinforcing new knowledge. Some find value in its repetitive use. Furthermore, a group of teacher candidates highlights that DERSİGO transforms mathematics instruction into an enjoyable learning experience. They believe that it can make mathematics more engaging, particularly for students who find the subject challenging. Certain teacher candidates have mentioned that DERSİGO activities can help students come to class better prepared. This, in turn, can assist students in addressing any deficiencies related to the subject matter before the lesson. Finally, it is suggested that DERSİGO, by providing a gamified competitive environment, can increase student participation in class. The competitive format is believed to encourage greater engagement among students. Additionally, some teacher candidates have observed that DERSİGO activities provide students with the opportunity to assess their knowledge levels. Those who share this view believe that students can determine where they excel and where they need improvement. Moreover, in terms of learning outcomes, DERSİGO is seen as potentially enhancing students' quick thinking and response capabilities.

In terms of learning outcomes, some candidates noted that the DERSİGO application helps in improving quick thinking and response abilities.

Table 3 presents the viewpoints of mathematics teacher candidates regarding the usability of DERSİGO.

Table 3. Views of Mathematics Teacher Candidates on the Usability of DERSİGO

<b>Positive subthemes</b>	<b>f</b>
<i>Various multimedia items such as pictures, audio and video</i>	18
<i>Application interface</i>	5
<i>Simple and convenient use</i>	7
<i>Being customized</i>	14
<i>Data analysis</i>	11

When examining Table 3, the opinions of mathematics teacher candidates reflect various perspectives on the usability of a digital educational application. User experiences encompass various factors such as technical issues, user-friendly

interface, the impact of visual materials, and contributions to the learning process. In this context, the candidate (TC18) stated, "This application is truly user-friendly. The videos explaining the topics and interactive quizzes make the lessons more comprehensible. Especially with colorful and visual content, it offers an engaging learning experience. The only downside is that I occasionally encounter issues when my internet speed is slow." Additionally, candidate (TC13) shared their thoughts on how students having personalized avatars, the ability to conceal their identities, gamified competitions, rewards, leaderboards, badges, and tracking statistical data on exam results are all beneficial features. Another candidate (TC8) commented, "The digital educational application called DERSİGO presents visual and interactive elements that enrich the learning experience. Installation is simple, the software size is small, and it's user-friendly. Furthermore, more guidance and support could be provided to enhance ease of use." Another perspective from the candidate (TC21) highlighted, "DERSİGO provides great convenience for students. They can effectively learn math topics by watching videos that explain concepts and then reinforcing the material with interactive tests. The app's interface is straightforward and comprehensible, facilitating lesson tracking. The inclusion of colorful and visual content will capture students' attention and create an engaging learning environment. The only disadvantage might be occasional connectivity issues with slow internet. Overall, I believe it's a fantastic tool for students to learn their subjects more effectively and enjoyably."

As a result, the opinions of pre-service mathematics teachers emphasize the user-friendly nature of the DERSİGO digital education application, the effect of visual and interactive elements on improving learning, and the difficulties of internet connection from time to time. This application seems to be a valuable tool for students to learn mathematics lessons more effectively.

The opinions of mathematics teacher candidates regarding the limitations or disadvantages of the use of DERSİGO in line with educational purposes are presented in Table 4.

When examining Table 4, it is observed that the limitations or disadvantages of using DERSİGO for educational purposes, as expressed by mathematics teacher candidates, include technical issues being one of the areas where the DERSİGO application is limited. In this regard, the candidate (TC15) has shared their thoughts by stating, "Students may face difficulties when they encounter computer or internet problems." Similarly, candidate (TC6) has expressed the opinion that "Problems may arise in case of slow internet connection," highlighting the impact of technical issues on usability.

Some participating teacher candidates have mentioned that the competitive atmosphere of the DERSİGO application might generate negative emotions such as stress and tension in students. Candidate (TC23) stated, "The competition situation can cause stress for individuals. Students experiencing pressure to answer questions correctly and quickly may undergo stress, which can directly affect their scores." Likewise, candidate (TC26) mentioned, "Situations where students cannot be at the forefront in ranking can lead to morale issues."

Additionally, some of the mathematics teacher candidates in the study believe that the DERSİGO application is inadequate and not suitable for mathematics instruction. In this context, candidate (TC4) commented, "I don't think it is applicable for every mathematics topic," and candidate (TC3) expressed, "I believe using paper and pencil is more beneficial in mathematics classes. DERSİGO should only be used for verbal subjects."

The limitations or disadvantages of using DERSİGO for educational purposes, as perceived by mathematics teacher candidates, include technical issues. Specifically, it has been observed that students may encounter difficulties when facing computer or internet-related problems. Some teacher candidates also express concerns about the potential issues arising from slow internet connections. Furthermore, the competitive atmosphere created by DERSİGO is seen by some teacher candidates as having the potential to generate negative emotions such as stress and anxiety among students. This pressure may lead students to experience stress when striving to answer questions correctly and quickly, which could directly impact their scores. Additionally, some mathematics teacher candidates believe that DERSİGO may not be suitable for mathematics instruction. They hold the view that it may not apply to every mathematical topic. Moreover, some argue that traditional tools like paper and pencil are more beneficial for mathematics classes, suggesting that DERSİGO should be reserved for subjects of a verbal nature.

In summary, mathematics teacher candidates identify technical issues, the potential for stress creation, and concerns about the suitability of DERSİGO for mathematics instruction as limitations or disadvantages associated with its use.

#### 4. Discussion

In this study, the aim was to evaluate the views of Mathematics teacher candidates regarding the DERSİGO digital educational application, which was developed using a full learning model and a gamified approach, and to assess the general features of the DERSİGO application developed for this purpose. The study aimed to explore the advantages of using the DERSİGO application in terms of educational objectives, its contributions to domain learning outcomes and the teaching process, its usability, as well as the limitations or disadvantages of its use in line with educational goals.

The DERSİGO application enables students to complete assigned tasks before the lessons, thus allowing them to

participate in classes more prepared and learn new topics more effectively. The results of the study indicate that the DERSÍGO application offers several advantages such as enhancing the learning process, increasing class engagement, and improving student interaction. When compared to traditional learning methods, the application provides more satisfying and engaging activities for students.

It can be noted that this application is highly appealing to students and can prevent them from getting bored during classes. The application makes lessons more attractive, increases student interest, and consequently enhances the desire to participate in class. This situation indicates the potential to elevate students' levels of achievement. The application's alternative learning method transforms the acquisition of knowledge into an enjoyable experience. Its ability to facilitate learning and ultimately enhance interest in the subject demonstrates its utility.

Students using the application will have the opportunity to observe their strengths and weaknesses in different areas. Additionally, based on the learning outcomes, it can be emphasized that the DERSÍGO application contributes to the development of quick thinking and response skills.

Positive sub-themes of the DERSÍGO application could include:

- **Multimedia Diversity:** The availability of various multimedia elements such as images, sound, and videos within the application can engage different sensory aspects, enriching the learning experience.
- **User-Friendliness:** The application's simple and user-friendly interface can positively influence the learning experience by allowing both students and teachers to access content effectively.
- **Privacy and Anonymity:** Allowing students to participate in the application with anonymous identities and create their avatars can create a comfortable and free learning environment, enhancing student engagement.
- **Management and Control:** The ability of the application administrator to effectively oversee gamification and competition processes can support teachers and parents in guiding students and providing an effective educational experience.
- **Detailed Reporting:** Generating detailed reports after gamification and competitions can provide teachers and parents with insights into student performance, allowing for better understanding and adjustment of learning strategies, ultimately enhancing educational quality.

The limitations or disadvantages of using DERSÍGO for educational purposes can be outlined as follows:

- **Technical Issues:** The possibility of encountering technical problems with the DERSÍGO application might lead to difficulties for students due to computer or internet-related issues, hindering efficient use of the application.
- **Internet Connectivity Problems:** Slow or intermittent internet connections could impede the smooth functioning of the application, making it challenging for students to use it effectively.
- **Competition-Induced Stress and Anxiety:** The competitive atmosphere of DERSÍGO may trigger negative emotions such as stress and anxiety in students. The pressure to respond quickly and accurately during competitions can lower students' self-confidence.
- **Competition and Deteriorating Morale:** The competitive nature of the application might lead to a sense of demoralization if students don't perform well in rankings. This could lower motivation and negatively impact the learning experience.
- **Applicability:** Some students might perceive DERSÍGO as suitable only for primarily verbal subjects. This uncertainty could arise regarding the effectiveness of the application in subjects like mathematics.
- **Importance of Traditional Approaches:** Certain students may believe that subjects like mathematics are better learned using traditional pen and paper methods. Consequently, there could be doubts about whether DERSÍGO can deliver the same efficacy in every lesson.
- **Technology Access:** Not all students may have access to the required technology and internet connectivity to use the application, potentially leading to inequality and excluding some students from participation.

These limitations and disadvantages should be taken into consideration for the effective use of DERSÍGO and for improving the design of the application.

This study was carried out on a specific group of students or teachers. Therefore, caution should be exercised when making further generalizations regarding the findings. Future studies may include participants from different age groups or educational levels. Certain data collection tools were used in the study. This tool may not fully reflect the experiences or thoughts of the participants. Future work in this area may overcome these limitations by using more diverse or customized data collection methods. Also, due to the limited time frame of the study, the opportunity for longer follow-up or more data collection may have been missed. Spending longer on this type of research can help produce better results.

Today, it is seen that technology is developing very rapidly. In this context, future research may examine more closely how digital education tools adapt to developing technology and how these changes affect the learning experience. More comprehensive analyses of data, such as in-depth interviews or more detailed statistical studies of student performance, can provide further insight into future research. In addition, such research can help educators and developers of digital education tools improve their teaching methods and practices.

The contributions of your research in the literature and the field are based on its potential to augment or improve existing knowledge. Our research is important because it offers practical advice for field professionals and decision-makers. The new data and findings obtained will contribute to enriching the knowledge in this field. In addition, our study can be a source of inspiration for researchers on how such applications can be carried out successfully.

During the literature review, deficiencies or gaps were identified on how technology integration in education affects key factors such as student participation, student motivation, teaching effectiveness, and student success, and our research is at a level that can contribute to filling these gaps drawing attention to the issue and eliminating these deficiencies.

Considering the requirements and anticipations of the contemporary youth, it's clear that the education system must incorporate diverse technological methods. Within this framework, it's crucial to track the innovations of the age and seamlessly integrate them into the teaching and learning procedures. Considering the findings from the subsidiary issues of this research, the subsequent suggestions can be put forth:

- Considering the effects of gamification, brought about by technological advancements, it can be said that such applications have the potential to facilitate work processes and encourage students to engage in their studies.
- With the thought that gamification methods can help students develop self-management skills and establish study routines, it is recommended to utilize such applications, particularly during extracurricular studies.
- The close relationship of today's youth with technology has made it clear that meeting their increased expectations through traditional educational methods is becoming challenging. As reflected in the research results, using these kinds of applications in all other subjects could be beneficial. Therefore, alongside traditional methods, offering these types of activities as alternatives in all subjects is recommended.
- Given the promise of gamified learning to produce enhanced outcomes among elementary school students, it is recommended to extend the development of such applications, originally designed for middle and high school students, to also encompass the primary school level.
- A significant majority of the research participants experienced this type of approach in their teaching process for the first time. Therefore, incorporating these applications into undergraduate courses is recommended. This approach can positively influence prospective teachers' views on technology integration and make them more conscious about such activities.
- While students possess mobile phones and internet access, they might prefer using the DERSİGO application on their computers to conserve their internet data. Providing students with wireless internet access or data usage rights could be considered in this case. This approach could ensure that students fully benefit from the advantages of the application.

Given the recommendations provided, it's evident that incorporating technology-based methods, such as gamification through the DERSİGO application, can greatly enhance the educational experience for today's youth and better align with their technological expectations.

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