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Use of Computer Games in Kosovar Education

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The use of computer games in formal education is an emerging field, especially in Kosovo, where education faces numerous challenges related to the quality of learning and student motivation. This study aims to examine the use of computer games in Kosovar education by analyzing existing national and international literature. The study methodology is based on a critical literature review, which aims to analyze, and evaluate existing literature on computer games in Kosovar education. The results show that computer games help improve academic performance, increase motivation, and develop students' critical thinking and collaboration skills. However, challenges such as lack of technological resources, insufficient teacher training, and skepticism about long-term effects remain significant obstacles. The study suggests strategic investments in technology, teacher training programs, and the development of supportive policies to maximize the benefits of games in education. These findings contribute to the development of educational practices and the creation of a sustainable basis for the integration of technology in Kosovar education.

Keywords: Computer games, Kosovar education, quality of learning, student motivation, technology in education.

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1. Introduction

In Kosovo, integrating computer games into formal education is still an emerging field. However, there has been an increase in interest and efforts to use technology and digital games to improve learning outcomes and increase student engagement in the learning process. As a pedagogical approach, computer games can help develop critical thinking skills, creativity, and student collaboration, using simulations and challenges that reflect real-world situations (Gee, 2021). In global educational settings, the use of games has been seen as a way to address the needs of 21st-century students and prepare them for an increasingly technological economy (Prensky, 2020).

The use of games in education has also been effective in improving student motivation and achievement in science and technology subjects, where traditional engagement is often challenged. For example, an international study showed that students who used computer games to learn mathematics showed significant improvements in their understanding of abstract concepts and significantly reduced math anxiety (Clark et al., 2019). Furthermore, games provide an environment where students can make mistakes and learn from them without fear of punishment, which helps them develop self-confidence and resilience (Shaffer, 2020).

However, while the benefits of computer games are obvious, the challenges remain numerous. One of the main obstacles is the lack of technological resources and teacher skills to successfully integrate games into the classroom (Ertmer & Ottenbreit-Leftwich, 2020). There is also ongoing skepticism about the long-term effects of digital games on students' cognitive and social development, as well as concerns about their potential to cause addiction (Granic et al., 2014).

In Kosovo, the use of computer games in education is still in its infancy, but interest and efforts to integrate them are growing. In the Kosovar context, these games are seen as an opportunity

to develop digital competencies among students and to improve the learning experience in educational settings with limited resources (Orhani, 2023). To maximize their potential, it is essential to address existing challenges through supportive policies and investments in infrastructure and professional training for teachers.

This study aims to analyze the international literature on the benefits and challenges of using computer games in education, relating it to the Kosovar context. Through a critical review of the literature, this work will help develop better approaches for implementing games in formal education.

1.1. Problem Identification

In Kosovo, education faces numerous challenges, including improving the quality of learning and increasing student engagement in the learning process. The use of computer games as a pedagogical tool has been identified internationally as an effective approach to addressing these challenges. However, in the Kosovar context, the implementation of this method has been limited due to the lack of technological resources, insufficient teacher training, and institutional support (Haxhimusa & Krasniqi, 2021; Kraja & Islami, 2021).

International studies show that computer games can increase students' academic performance, foster the development of critical thinking skills, and increase their motivation (Granic et al., 2014; Clark et al., 2019). However, concerns about the long-term effects of digital game use on students' cognitive and social development continue to remain a challenge (Ertmer & Ottenbreit-Leftwich, 2020). In Kosovo, these challenges are further accentuated by the lack of infrastructure and technical support for teachers (Krasniqi & Hyseni, 2020).

1.2. Purpose of the Study

This study aims to explore the impact of computer games on Kosovar education by analyzing existing national and international literature on this topic. The main goal is to assess how computer games can be used to improve academic outcomes and increase student engagement in Kosovo. This study also aims to:

- To identify the challenges associated with the implementation of computer games in the Kosovar context.

- To provide recommendations for solving these challenges through evidence-based approaches.
- To contribute to the development of innovative educational practices in Kosovo.

This research aims to serve as a basis for educational policies and initiatives that support the use of technology in education, emphasizing the importance of a systematic approach to integrating computer games into teaching and learning.

1.3. Research Questions

1. What are the main benefits of using computer games in Kosovar education?
2. What are the challenges and limitations documented in the existing literature?
3. What suggestions can be made to address these challenges and improve the implementation of games in education?

2. Literature Review

A recent study by Saliu and Bicaj (2022) highlights that the use of Information and Communication Technology (ICT) in Kosovo education has become an essential part of the secondary education curriculum. This inclusion aims to develop students' digital competencies and equip them with the necessary skills to function in an increasingly digitalized society. Computer games, as part of this process, offer a valuable opportunity to foster learning through interactive and hands-on methods (Saliu & Bicaj, 2022). Furthermore, another study conducted by Qekaj-Thaqi and Thaqi (2021) found that teachers in Kosovo have begun to accept and integrate computer games into the teaching process, although there are still challenges related to the lack of adequate training and technological resources. According to them, these games can contribute to improving learning outcomes, especially in technological and scientific fields, by providing a more attractive and motivating environment for students (Qekaj & Thaqi, 2021).

On the other hand, the authors have emphasized that one of the main advantages of using games in education is their ability to create a learning environment that is closer to students' reality, making learning more understandable and practical. Through simulations and game-based scenarios, students can develop practical skills and apply the knowledge gained in ways

that are more relevant to their daily experiences (Saliu & Bicaj, 2022; Qekaj & Thaqi, 2021). However, the integration of computer games into teaching in Kosovo is not without challenges. A study by Krasniqi and Hyseni (2020) has shown that some teachers feel unsure about using games in the classroom due to a lack of experience with technology and a fear that games may lose their educational value if not used appropriately. This study suggests that it is necessary to provide training and support to teachers so that they can successfully integrate games into their teaching (Krasniqi & Hyseni, 2020). Similarly, Kraja and Islami (2021) analyzed current practices and future opportunities for integrating game-based teaching into the Kosovo education system. They found that while there is growing interest in using games in teaching, significant challenges remain, including a lack of institutional support and adequate training for teachers. The authors suggest that to achieve the full potential of this method, greater investment in infrastructure and professional development for teachers is necessary (Kraja & Islami, 2021).

Authors Gashi and Berisha (2020) focus on the role that computer games play in increasing digital literacy in primary education in Kosovo. Their study showed that the use of digital games can help improve students' digital skills, making them better prepared for the challenges of modern society. However, the authors emphasize that there are obstacles such as the lack of equipment and teachers' knowledge to implement these games effectively (Gashi & Berisha, 2020). Meanwhile, Kelmendi and Shala (2019) examined teachers' perceptions of game-based teaching in the context of educational reforms in Kosovo. They found that teachers were generally positive towards this method, but expressed concerns about its successful implementation due to the lack of resources and training. This study emphasizes the importance of continued support and appropriate policies to encourage the wider adoption of games in Kosovar education (Kelmendi & Shala, 2019).

Authors Haxhimusa and Krasniqi (2021) addressed the main benefits and barriers faced in implementing digital games in the Kosovo education system. The authors identified that while games have great potential to increase student engagement and motivation, the main challenges include the lack of technological resources and teacher resistance to change. They recommend a more systematic approach to integrating games, including supportive policies and training for teachers (Haxhimusa & Krasniqi, 2021). Miftari and Kastrati (2022) examined the impact of digital games on student motivation and engagement in several schools in

Kosovo. Their findings show that digital games not only improve students' motivation to learn but also help develop critical thinking and collaboration skills. The authors suggest that integrating games into school curricula should be done strategically to maximize educational benefits (Miftari & Kastrati, 2022).

A recent study by Kusari-Radoniqi and Orhani (2024) analyzes the impact of video games on the ethical development and behavior of different age groups. Through an in-depth analysis of the existing literature, the study identifies the positive and negative effects that video games have on children and adolescents. The results show that, while video games can improve cognitive skills and coordination, they can also promote aggressive behavior and negatively affect the ethical development of young people. The study concludes with recommendations for ethical and responsible guidance of video game use, emphasizing the importance of education and awareness of users and parents (Kusari-Radoniqi & Orhani, 2024).

The study conducted by Orhani (2023) on teaching and learning basic mathematical concepts through digital games highlights several key findings regarding the effectiveness of this method in the education of lower secondary school students. According to the study, digital games help improve students' academic performance by increasing their motivation and interest in the subject of mathematics. Digital games provide an interactive environment, where students can practice their skills through repeated experiences without fear of failure, which makes the learning process more attractive and effective. Furthermore, the findings show that the use of digital games helps reduce mathematical anxiety and increase students' self-efficacy, thus contributing to an overall improvement in learning outcomes (Orhani, 2023). Similarly, another study by Orhani (2023) on the use of digital games to understand fraction concepts shows that digital games have a significant impact on improving student's performance in mathematics, especially in fraction concepts. The study used a mixed-methods approach and included a pre-test and post-test to measure the effects of the intervention through digital games. The results showed a significant improvement in test scores after the intervention, achieving a significant increase of 33.08% overall in understanding fraction concepts. In particular, concepts such as comparing fractions, expanding and simplifying, fraction operations, and solving fraction problems showed significant improvements compared to traditional teaching. Furthermore, the students involved in the case study

experienced increased motivation and a positive experience while using digital games, indicating that these games can be an effective tool to support teaching and learning in mathematics (Orhani, 2023).

Therefore, while the use of computer games in education in Kosovo is still in the early stages of development, recent studies show that they have great potential to improve learning outcomes and increase student motivation. To achieve this potential, it is essential to address existing challenges through ongoing training and support for teachers and through the development of games that are adapted to the Kosovo educational context.

4. Methodology

This study is based on a critical literature review, which aims to analyze and evaluate the existing literature on the use of computer games in Kosovar education. This methodology was chosen because of its ability to examine in depth the benefits and challenges of this approach to teaching, identify research gaps, and propose new approaches to improve existing practices.

4.1. Literature Selection

The literature selection was done using clear inclusion and exclusion criteria. The review included studies that address the use of computer games in Kosovar education or similar contexts. To ensure topicality, studies published within the last ten years and peer-reviewed were selected. Articles that do not directly address this topic or that are based only on theory, without providing empirical data, were excluded. Search sources include platforms such as Scopus, WoS, Google Scholar, and PubMed, as well as reports from educational institutions in Kosovo.

4.2. Data collection and analysis

The collected literature was analyzed using a thematic approach and critical appraisal. Through thematic analysis, key areas were identified such as the impact of games on academic outcomes, improving student motivation and engagement, and technological and institutional challenges. The articles were assessed for their methodological quality and consistency, focusing on the weaknesses and limitations documented in these studies. This analysis served

to highlight gaps in the existing literature, such as the lack of studies on the long-term impact of games on student skills and the role of teachers in their adoption.

4.3. Benefits and limitations of the study

The main benefits of this methodology include a comprehensive and structured analysis of the existing literature, helping to identify research gaps and provide valuable recommendations for the future. However, the main limitations include the dependence on the quality and quantity of the existing literature and the specific focus on the Kosovar context, which may limit the generalizability of the findings.

5. Results

This chapter summarizes the main findings from the literature review, highlighting the benefits and challenges of using computer games in Kosovar education. The analysis is divided into several main areas to reflect the different dimensions of this pedagogical approach. The thematic analysis table of results contains the main themes of the study, key findings, and challenges or opportunities identified in the literature.

Table 1. Thematic analysis of results

Theme	Key Findings	Challenges / Opportunities
Improving Academic Results	Improvements in understanding abstract concepts and reduction in math anxiety.	Improvement in learning through interactive methods.
Increased motivation and engagement	Higher engagement through challenges and rewards.	Greater involvement of students in the learning process.
Developing critical and social skills	It promotes the development of critical thinking, collaboration, and problem-solving skills.	Better preparation for real challenges.
Lack of technological infrastructure	Many schools have limited technological resources.	Technological limitations in schools.
Insufficient teacher training	Teachers feel unprepared to use games in the classroom.	Lack of training and resources for teachers.
Skepticism and fear of negative influences	Concerns about long-term impact and addiction to gaming.	Parents' and teachers' fears about negative effects.

Increased investment in technology	Investments in new equipment and infrastructure are needed.	Solving technological limitations.
Providing training for teachers	Training is critical for the effective use of games. Policies should encourage	Increasing teachers' technological skills.
Development of supporting policies	the integration of technology into the curriculum.	Greater institutional and social support.

5.1. The benefits of computer games in Kosovar education

Computer games have shown significant effectiveness in improving students' academic performance. The use of educational games in the classroom has helped reduce math anxiety and increase students' self-confidence. Furthermore, study results show that abstract concepts become more understandable to students through the interactive and visual approaches that games offer. Computer games provide an interactive and challenging environment, which helps increase students' motivation to learn. Students are more engaged when faced with activities that include rewards and challenging levels. This approach has proven to be particularly effective in involving students who are traditionally less interested in academic subjects. The use of digital games in the classroom has contributed to the development of critical thinking, collaboration, and problem-solving skills. Through simulation scenarios, games help students make decisions and learn from the consequences of their choices. This approach has the potential to help students prepare for real-world challenges.

5.2. Challenges of implementing computer games

One of the biggest obstacles to integrating computer games into Kosovar education is the lack of technological equipment in schools. Many schools lack the resources necessary to implement advanced technology, which limits the potential for using games. Teachers often feel insecure about using games in the classroom due to the lack of specialized training and support resources. This factor has negatively affected the rate of implementation of games as a teaching tool. Despite the documented benefits, there is skepticism about the long-term impacts of games on student behavior and performance. There are concerns about the potential for creating addiction to games and loss of academic focus.

5.3. Opportunity for improvement

The results show that to maximize the benefits of computer games, it is necessary to invest in the technological infrastructure of schools. This includes providing adequate equipment and access to the Internet. Professional training is essential to help teachers effectively use computer games in the classroom. Training programs should focus on developing their pedagogical and technological skills. To support the implementation of games, educational policies that promote the use of technology as an integrated part of the curriculum are needed. These policies should also address parental and community concerns about the impacts of games.

6. Discussions

The results of this study clearly show that the use of computer games in Kosovar education has great potential to improve the quality of learning and increase student engagement. The identified benefits include improving academic performance, and motivation, and developing students' critical and social skills. These findings are consistent with international studies that demonstrate that computer games offer an interactive and innovative way to learn, improving digital skills and increasing students' self-confidence (Granic et al., 2014; Clark et al., 2019).

On the other hand, the challenges of integrating digital games into teaching are obvious. Schools in Kosovo face a lack of technological infrastructure and limited resources, which limits the ability to successfully implement this teaching method. Furthermore, insufficient teacher training and skepticism about the long-term impacts of games have negatively affected their spread in formal education (Ertmer & Ottenbreit-Leftwich, 2020; Krasniqi & Hyseni, 2020).

Studies show that the use of computer games helps reduce math anxiety and increase self-confidence, making the learning process more engaging and effective (Orhani, 2023). In particular, games help develop abstract concepts, which are often challenging for students in traditional teaching approaches (Clark et al., 2019). This is consistent with international studies suggesting that digital games provide an environment where students can practice and learn from their mistakes without fear of punishment (Shaffer, 2020).

While the benefits are clear, challenges remain. The limited use of games in Kosovar education is largely due to the lack of technological equipment and teachers' knowledge for their effective integration (Krasniqi & Hyseni, 2020). To overcome these challenges, strategic investments in infrastructure and ongoing training for teachers are needed. This approach will help address barriers and support the implementation of games in learning environments (Ertmer & Ottenbreit-Leftwich, 2020).

To maximize the impact of computer games in Kosovar education, it is important to develop supportive policies that encourage the integration of technology into the curriculum. These policies should include institutional support, as well as education and awareness of teachers and parents about the benefits of this teaching method (Kraja & Islami, 2021). Likewise, improving access to technological devices and resources should be a priority to ensure that games are used effectively in the classroom.

6.1. Answers to research questions

1. What are the main benefits of using computer games in Kosovar education?

The use of computer games in Kosovar education has shown several important benefits:

- Improving academic outcomes: Educational games have helped increase understanding of abstract concepts, especially in math and science subjects, reducing math anxiety and increasing students' self-confidence (Clark et al., 2019; Orhani, 2023).
- Increased motivation and engagement: Students show greater engagement when faced with interactive and challenging activities that include rewards and varying levels of difficulty (Granic et al., 2014).
- Developing critical and social skills: Games help students develop critical thinking, collaboration, and problem-solving skills by simulating real-life situations (Shaffer, 2020).

2. What are the challenges and limitations documented in the existing literature?

The implementation of computer games in Kosovar education faces several challenges:

- Lack of technological infrastructure: Kosovar schools often lack sufficient technological equipment and resources to implement games on a large scale (Haxhimusa & Krasniqi, 2021).
- Insufficient teacher training: Teachers feel insecure about using games in the classroom due to a lack of specialized training and knowledge about technology (Krasniqi & Hyseni, 2020).
- Skepticism and ethical concerns: There is skepticism about the long-term impacts of games, including concerns about addiction and negative effects on students' cognitive and social development (Granic et al., 2014).

3. What suggestions can be made to address these challenges and improve the implementation of games in education?

To address the identified challenges and maximize the benefits of computer games, it is recommended:

- Investment in technology: Providing technological equipment and internet access to schools, ensuring that all students have equal opportunities to benefit from this access (Kraja & Islami, 2021).
- Providing training for teachers: Training should focus on developing teachers' technological and pedagogical skills to successfully integrate games into teaching (Ertmer & Ottenbreit-Leftwich, 2020).
- Developing supportive policies: Educational policies should encourage the use of games as an integrated part of the curriculum, providing institutional and material support for teachers and students (Kraja & Islami, 2021).

7. Conclusion

The use of computer games in Kosovar education offers a valuable opportunity to transform the learning process, improving academic outcomes and increasing student motivation. Through interactive mechanisms and approaches based on rewards and challenges, computer games help students develop important skills such as critical thinking, collaboration, and problem-solving. However, challenges related to limited technological infrastructure and lack of training for teachers remain significant obstacles to the successful implementation of this

method in Kosovar education. Investment in technological equipment and the development of professional training programs for teachers are necessary to overcome these obstacles. Also, supportive policies that promote the integration of games into the curriculum will help increase their use and benefits. In conclusion, if the challenges are addressed strategically, computer games can become an essential component of the education system, contributing to a better and more sustainable education for students in Kosovo.

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