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E-Sport in Education: A Systematic Review of Enhancing EFL Learning through Competitive Gaming Activity

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Abstract

The rapid rise of e-sports in recent years has prompted educators to explore its potential as a tool for enhancing learning. This systematic review aims to investigate the impact of e-sports on developing cognitive, social, and technical skills among students. A comprehensive literature search was conducted on academic databases such as Google Scholar, Scopus, and Web of Science, covering studies published between 2019 and 2024. The inclusion criteria were research article discussing the use of e-sports in education and its impact on student skills, written in English of the national language. After removing duplicates, titles and abstracts were screened, and eligible article were then reviewed in their entirety to extract relevant data. The results indicate that participation in competitive gaming can enhance problem-solving abilities, critical thinking, teamwork, communication, and digital literacy. However, challenges such as accessibility for students with cognitive impairments and potential negative health impact mush be addressed. Despite these challenges, the findings suggest that with careful implementation, e-sport can be a valuable addition to traditional educational methods. Future research should focus on long-term impacts and optimal integration strategies to maximize the educational benefits of e-sports.

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INTRODUCTION

E-sports or electronic sports have exploded in popularity over the past decade, with millions of players and viewers around the world. According to Newzoo (2018) the global e-sports market reached a value of $1.38 billion with an audience of 500 million people. This phenomenon is not just entertainment but is also used in education as a potential learning tool. (Hamari, 2017) showed that e-sports have become a large industry with wide influence, including in the field of education. As e-sports develop, many schools are using gaming competitions to improve students' skills. These developments show that e-sports have the potential to be more than just games but can also be an effective learning tool. The rise of e-sports can be attributed to several factors, including technological advances, increased accessibility to high-speed internet, and the growing popularity of online streaming platforms such as YouTube Gaming.

The platform makes it easy for gamers to connect, compete and share their experiences with a global audience.

The rapid evolution of e-sports and its growing integration into educational while the whole world was fighting with covid-19, the sports was aslo affected by this by this situation and faced a series of crises (Türkmen & Özsarı, 2020). Çetin & Coşkuner (2021) stated that e-sport is considered to be included in the Olympic games by the International Olympic Committee (IOC and is expected to be accepted as a medal sport in Asia 2024. However, due to the covid-19 pandemic, which deeply affects allhumanity and many industries in the world global e-sports revenues, which are expected to be 1.1 billion dollars in 2020, remained at level of 950.3 million dollars. Despite this, e-sports revenues are expected to increase by 15% until 2023, to reach 1.6 billion dollars. Moreover, the total number of viewers of 443 million in 2019 increased by 11.7% in 2020, reaching 495 million viewers. The total of viewers estimated for 2023 is 646 million (Newzoo, 2020).

The e-sports landscape continues to evolve, with new games, plaforms and technologies emerging regularly (Bányai et al., 2019). Cho et al. (2019) observed a growing trend in which schools and universities are incorporating e-sports into their curricula and extracurricular programs. In the wake of COVID-19 pandemic, Jang and Byon (2020) highlighted how e-sports can offer innovative solutions for distance learning and student engagement. E-sports also intersect with various fields, including phychology, computer science, and sport management. In this context, a critical approach to technology in learning becomes relevant. Santosa (2020) emphasized the importance of a critical approach in technology-based literacy instruction, which can be applied in the use of e-sports for education.

The professionalization of e-sports, with structured leagues, sponsorship deals, and large prize pools, has legitimized competitive gaming as a viable career path for many young individuals. In an educational context, e-sports offer a unique opportunity to engage students in ways that traditional methods may not. According to Griffiths (2002) e-sports can develop students' cognitive and social skills, such as problem solving, teamwork and leadership. The interactive and immersive nature of video games can attract students' attention and motivate them to actively participate in the learning process. Additionally, the strategic and analytical aspects of many e-sports titles require players to think critically and make decisions quickly, thereby encouraging cognitive development. However, the application of e-sports in education still raises debate. Some experts, as discussed by Griffiths (2002), believe that e-sports can develop students' cognitive and social skills. In contrast, the research of Van Rooij et al. (2018) highlighted the risks of addiction and health problems associated with e-sports. A meta-analysis study by Wang et al. (2022) demonstrated the complex relationship between gaming and academic performance is highlighting the need for a careful approach in integrating e-sports into school curricula. Therefore, it is important to evaluate the benefits

and challenges faced in using e-sports as an educational tool. This research aims to investigate the potential of e-sports to improve student learning. This will assess the potential benefits of e-sports, including improved cognitive, social and technical skills. According to Shaffer (2007), e-sports can help children learn by developing critical and analytical thinking skills. Additionally, an industry report from Newzoo (2018) showed that e-sports is becoming more popular, especially among the younger generation, and can be used in education.

Previous studies have explored the potential benefits of using e-sports in education. Griffiths (2002) suggested that e-sports can develop students' cognitive and social skills, such as problem-solving and teamwork. Additionally, Shaffer & Gee (2006) found that e-sports can help children learn by developing critical and analycal thinking skills, Furthermore, an industry report from Newzoo (2018) showed that e-sports is becoming more popular, especially among younger generation, and can be used in education.

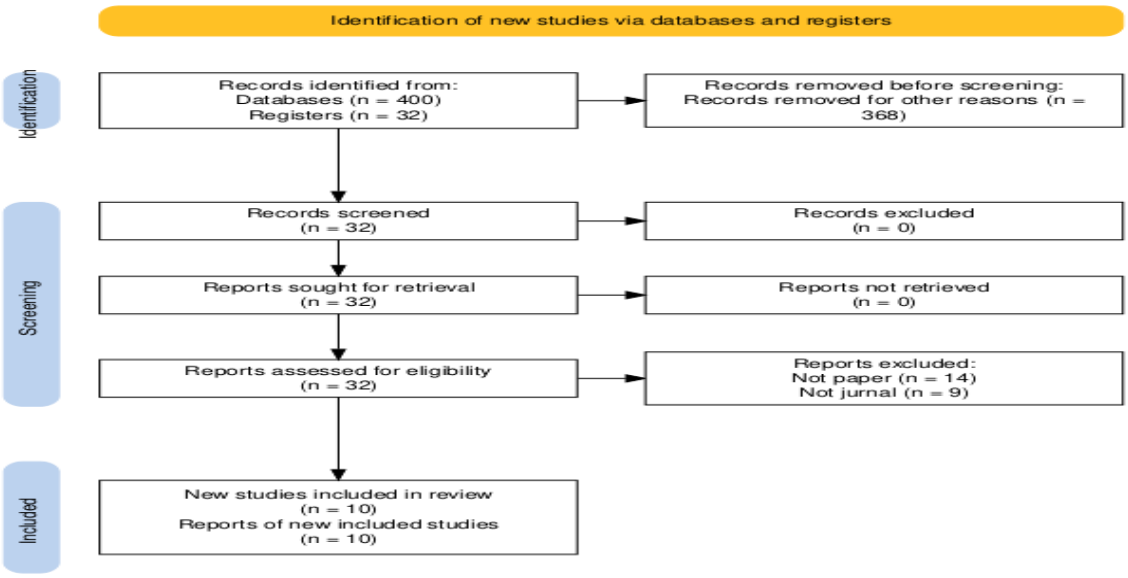
While these studies valuable insights, there is a need to futher explore the specific factors that influence the effectiveness the e-sports as a learning tool. This study seeks tp uncover novel insights that can inform educational practices and policy decisions regarding the integration of e-sports in schools by investigating the impact of e-sports on students' cognitive, social, and technical skills. A study conducted by Bowman and Tamborini (2015) showed that emotions can influence video game use, which can be connected to how e-sports affects student learning. In addition, Van Hilvoorde and Pot (2017) stated that basic motor skills are also involved in e-sports, which is relevant for considering the physical aspects of e-sports integration in education. This research contributes to a better understanding of the role of e-sports in learning and its future potential in education. The aims of this research are: 1) to investigate the potential of e-sports in improving students' cognitive, social and technical skills. Based on the main objective, the research question in this systematic review is how can e-sports improve students' cognitive, social and technical skills?

RESEARCH METHODOLOGY

The methodology in this research follows the PRISMA guidelines (Page et al., 2021) for conducting a comprehensive systematic review. A comprehensive literature search was comducted on three major academic databases, namely Google Scholar, Scopus, and Web of Science. The combination of keywords used in the search included "e-sports", "learning", "cognitive skill", "social skill", and "technical skill". The inclusion criteria set for selecting articles were: (1) research articles discussing the use of e-sports in education and its impact on students' skill, (2) written in English or a national language, and (3) published in the 2019–2024-time frame. This is based on Fakazlı (2020) statement that the COVID-19 pandemic has prompted many people to seek entertainment in the form of video games and e-sports, which are a rapidly growing trend. Articles that met these criteria were then filtered

based on the title and abstract. Next, articles that passed the initial selection were read in full to extract relevant data such as authors year of publication, research location, results, and key findings. The extraxted data were analyzed qualitatively to identify key themes and findings related to the potential of e-sports in enhancing student learning, as well as the benefits and challenges of integrating it into the educational curriculum. Figure 2.1 shows the PRISMA model that illustrates the article selection process in this study.

Figure 2.1 The PRISMA Model



To ensure the selection of studies those are relevant and appropriate to the aims of this study, table1 below provides details of the specific inclusion and exclusion criteria. These criteria are used to select articles for further analysis.

Table 2.1 Inclusion and Exclusion criteria

Inclusion criteria	Exclusion criteria
Articles written in English or the national language	Articles writtem in others languages
Articles published between 2019-2024	Articles published before 2019 or after 2024
Article discussing the use of e-sports in education and its impact on students skills	Articles not related to e-sports in education
Articles that discuss cognitive skills, social skills, and technical skills related to e-sport	Articles that do not discuss these skills
Research article (original research, reviews, case studies)	Non-research articles (news, opinion pieces, editosials)
Unique articles (duplicates removed)	Duplicated articles

RESULT AND DISCUSSION

The articles that have been selected talk about using e-sports in schools and how competitive gaming might help students learn better. Some studies have looked at how e-sports can be used in education to improve different skills. Researchers have tried out e-sports programs in schools in different countries. This research focuses on two main things: first, how e-sports programs can make students more interested and excited about learning. Second, it looks at how playing e-sports might help students get better at problem-solving, teamwork, and thinking strategically. The results show that using e-sports in education can help students learn and do better in school. Also, other studies show that students who play e-sports can get better at thinking critically and working well with others. More details about these studies can be found in Table 3.1.

Table 3.1 The Overview of Related Studies

No	Author	Location	Result	Findings
1	Dilek (2019)	Not specified	Positive	The findings are presented in a way that suggest e-sport events and entertainment experiences
2	Pradnyadewi et al. (2024)	Bali, Indonesia	Positive	The findings suggest that shorter gaming durations correlate with lower risks of DQS among e-sports players,
3	Marta et al. (2020)	Jakarta Utara, Indonesia	Positive	The pandemic led to more people doing indoor/digital activities for self-actualization, creative skills, and sportsmanship. E-sports were seen as a good alternative to meet these needs during lockdowns.
4	Kurniawan (2019)	Indonesia	Positive	The findings suggest that E-sport is becoming more popular. It was included in the 2018 Asian Games, which showed that people accept E-sports as a sport.
5	Nugroho et al. (2022)	Indonesia	Positive	The influence on sports culture includes developing creativity, discipline, mutual respect, and hard work.

6	Cinquin et al. (2019)	France	Negative	The review found little research on e-learning accessibility for the cognitively impaired.
7	Bradley (2020)	United Stated	Positive	Learning Management Systems (LMS) support online learning environments that promote collaborative activities, discussions, and communication among users.
8	Huk (2019)	Poland	Positive	The findings suggest that the human benefits related to cognitive and social development, identity development, and participation in entertainment were determined.
9	Bayrakdar et al. (2020)	Turkey	Negative	The findings suggest that E-sports may have negative impacts on physical health.
10	Leis et al. (2021)	Germany	Positive	The findings suggest that SEP's psychological approaches and methods are well-suited for studying various aspects of E-sports.

The integration of e-sports into educational settings has largely shown positive results, with eight out of ten studies reporting beneficial results. These studies show that engaging in competitive games can improve a variety of cognitive abilities, including problem solving, critical thinking, and strategic planning (Huk, 2019; Nugroho, 2022). Moreover, e-sports participation has been founf to foster impotant social skills such as teamwork, communication, and mutual respect (Kurniawan, 2019; Marta, 2020). The growing acceptance of e-sports, evidenced by its inclusion in major sporting events, futher underscore its potential as an education tool (Dilek, 2019). The COVID-19 pandemic has accelerated the adoption of e-sports in education, with several studies highlighting its value as an alternative learning tool during lockdown (Bradley, 2020; Marta, 2020).

Furthermore, the result of this study shows that e-sport has significant potential improving studemts' skills. This finding is in line with Santosa (2017) observation the generation Z's learning approach shows a positive tendency

towards the use of technology in learning. In the context of e-sports, this trend is manifested in several key aspects. Participation in e-sports can enhance students' digital skills. This aligns with Paramahita et al. (2023) who emphasized the impotance of developing comprehensive digital literacy among students. In the context of e-sports, digital literacy skills include not only the ability to use technology but also the ability to analyze, evaluate, and create digital content. Effective to use of technology in education requires the development of thorough digital literacuy skills, which are laso highly relevant in e-sports participation (Paramahita et al., 2023).

However, the implementation of e-sports in education is not without challenges. Some studies have identified potential negative impacts, including physical health problems associated with prolonged gaming (Bayrakdar et al., 2020) and a lack of research on e-learning accessibility for induviduals with cognitive impairments (Cinquin, 2019). These finding emphasize the need for a balanced approach for implementing e-sports in education, one that maximizes benefits while mitigating potential risks. Additionally, there are significant research gaps, particularly in understanding the long-term impact of e-sports on learning outcomes and optimal methods for integrating competitive gaming into the curriculum (Leis, 2021; Pradnyadewi, 2024).

Given these findings, this review calls for more robust research designs in future research, including larger sample sizes and control groups. There is a clear need to investigate the specific factors that influence the effectiveness of e-sports as a learning toolm as well as conducting longitudinal studies that assess the long-term impact on student development. Despite these challenges, overall trends suggest that e-sports, when implemented carefully, has the potential to significantly enhance the educational experience by tapping into student interests and leveraging the engaging nature of competitive gaming to develop critical skills for success in the digital age.

The integration of e-sports into educational curricula requires careful consideration of several factors. One key aspect is the selection of appropriate games that align with educational objectives. Barzilai & Blau (2014) emphasized the importance of choosing games that are congruet with the learning goals to maximize their positive impact on students' learning achievements. Not all e-sports titles are equally suited for educational purposes, and educators must carefully evaluate games based on their cognitive skills, teamwork, and potential for skill development. Additionally, the role of teachers in facilitating e-sports-based learning experiences is crucial. Zhong et al. (2022) highlighted the need for professional development programs focused on e-sports in education to effectively prepare teachers to integrate e-sports into their teaching methods, guide students through reflective practices, and connect gaming experiences to academic concepts.

A part from that, another important consideration is the potential of e-sport to address issues of equity and inclusion in education. While e-sports can provide opportunities for students who may not excel in traditional sports,

there are also concerns regarding access to technology and the potential to exacerbate existing digital divides. Ratan et al. (2015) discussed the gender gap in e-sports is highlighting the need for inclusive program plans. Future research should explore how e-sports programs can be designed to be inclusive and accessible to all students, regardless of socioeconomic background or physical ability. Additionally, as e-sports develop as an industy, there is potential to develop career paths for students interested in fields such as game design, event management, and sports analysis. Hallmann and Giel (2018) explored the professionalization of e-sports, suggesting potential career opportunities in this growing field. Funk et al. (2018) further emphasized the importance of embracing e-sports education and research opportunities in sports management curricula. Exploring the relationship between e-sports education and future career opportunities can provide valuable insight into the long-term benefits of integrating e-sports into the educational environment.

CONCLUSION

This systematic review has explored the potential for using e-sports in educational settings to enhance student learning. The collective evidence from the research analyzed showed that e-sports can be an effective tool for developing students' cognitive, social and technical skills. Engaging in competitive gaming appears to improve problem-solving abilities, critical thinking, teamwork, communication, digital literacy, and other valuable competencies. However, the integration of e-sports into the school curriculum is not without challenges. Issues such as accessibility for students with cognitive impairments, potential negative health impacts from excessive gaming, and inconsistent findings regarding academic performance need to be addressed carefully. A balanced approach that maximizes benefits while mitigating risks is critical to successful implementation. It is important to note that many of the studies reviewed had limitations, such as small sample sizes, lack of control groups, and non-validated measurement instruments.

Most studies were conducted in specific countries or regions, limiting cross-cultural generalizability, although these findings are promising, there are still several gaps in understanding the specific factors that influence the effectiveness of e-sports as a learning tool. Future research should investigate optimal game types, duration, and methods of curricular integration. Longitudinal studies that assess the long-term impact of e-sports on student learning outcomes and development are also needed. Overall, this systematic review shows that e-sports have the potential to revolutionize education by tapping into student interests and exploiting the engaging nature of competitive gaming. With careful implementation and ongoing research, e-sports can be a valuable addition to traditional teaching methods, developing critical skills for success in the digital age.

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AUTHOR CONTRIBUTION STATEMENT

The authors confirm their contribution to this manuscript by jointly conceptualizing, researching, and preparing the study. All authors were involved in the literature review, data analysis, and manuscript writing.

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