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Mapping Research Trends on the Effectiveness of Gamification in Physical Education and Sport Based on Bibliometric Analysis Using Scopus Baseline Data From 2020-2025

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A R T I C L E I N F O

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A B S T R A C T

Abstract must be This study analyzes the trend of gamification in Physical Education and Sport between 2020 and 2025 using qualitative bibliometric methods with the keywords ". gamification AND in AND physical AND education AND sport" Data collected from 19 documents in Scopus were analyzed using VOSviewer for trend mapping and bibliometric visualization. The results of the study show an increasing focus on the use of technology, with the implementation of digital tools and online platforms to enhance the learning experience. In addition, student motivation and engagement are dominant elements, with the implementation of competitions and rewards to improve learning outcomes. The study also notes the growth of international collaboration on this topic, although access to technology and resources in developing countries remains a challenge. Although the number of publications shows, Ferriz-Valero, A. emerged as the most prolific author. This study reveals that gamification in Physical Education and Sport continues to evolve, with contributions from various disciplines, and requires further research to address challenges and maximize potential in the field of sport gamification

INTRODUCTION

Introduction Gamification in Physical Education and Sports (PJO) has become a topic that is attracting increasing attention in the period 2020 to 2025.(Sotos-Martínez et al., 2024),The concept of gamification, which essentially integrates game elements into non-game contexts, including education, has been shown to increase student engagement, motivation, and participation in physical activities.(Arufe-Giráldez et al., 2022)Physical education, which aims to improve physical fitness and develop social skills, is now finding new ways to engage students through a game-based approach.(Montiel-Ruiz et al., 2023),In the last five years, gamification has been used as a ,tool to refresh learning methods and provide a more enjoyable ,experience in PJO.(Liu & Lipowski, 2021)Since 2020, numerous studies and experiments have demonstrated the potential of gamification to solve classic problems in physical education, such as low student participation in sports.(Melero-cañas et al., 2021)Physical activities that are often considered boring or irrelevant to students' daily lives can be made more interesting by implementing game elements.(Mora-Gonzalez et al., 2023)This includes providing points, challenges, levels, and awards that motivate students to compete and improve their performance in physical activities.(Navarro-Mateos et al., 2024),In this period, gamification is also increasingly complemented by ,technology, which enables a more interactive and personalized ,learning experience.(Flores-Aguilar, Iniesta-Pizarro, et al., 2023a),In 2020, the application of gamification in physical education is still relatively new, but is starting to receive special attention among educators and researchers.(Feng et al., 2023),During this time, various experiments were conducted in several schools to explore how game elements such as points, badges, and leaderboards could be implemented to increase student engagement.(Latre-Navarro et al., 2024)One of the key findings of the 2020 study was that students involved in gamified sports activities showed increased motivation and participation compared to those involved in traditional sports programs.(Carcelén-Fraile, 2025),Even though there is not yet much data available, this trend opens up huge potential for gamification in physical education.(Flores-Aguilar, Prat-Grau, et al., 2023)In 2021, gamification began to enter a more mature stage, with numerous studies measuring its impact on students' learning outcomes and physical fitness.(Pérez-Muñoz et al., 2022)This year marked an increase in the use of digital applications and wearable devices in PJO gamification.(Flores-Aguilar, Iniesta-Pizarro, et al., 2023b),Some schools are starting to integrate technology, such as fitness tracking apps and gamification platforms, to provide students with real-time feedback on their progress.(Invernizzi et al., 2021)Students using the tracking app can see how many calories they've burned or how far they've run, and earn rewards in the form of points or levels based on those achievements.(Fernandez-Rio et al., 2022),This technology allows students to be more engaged and motivated to participate in sports,In 2022, gamification in physical education is increasingly leading to further integration between sports and technology.(Parra-González et al., 2021)Schools are starting to use fitness tracking devices and online platforms to manage virtual competitions and challenges.

Educators can monitor student progress through apps connected to wearable devices, such as smartwatches or activity trackers, which record data in real-time.(Fernández-Gavira et al., 2022)This gives students the opportunity to compete, both individually and in teams, inside and outside the classroom.This approach provides a more personalized experience and encourages students to set goals and track their own progress, which increases their intrinsic motivation to continue exercising.(Rodríguez-Ferrer et al., 2024),Over time, by 2023, research shows that gamification not only increases participation, but also contributes to improving students' physical fitness.(Manzano-León et al., 2021),Based on several case studies, students involved in gamification ,programs demonstrated significant fitness improvements, including increased ,endurance, muscle strength, and agility.(Chugh & Turnbull, 2023),In addition, gamification has also been shown to improve social skills, such as teamwork and communication, because many gamification elements involve collaboration between students.(Lampropoulos & Kinshuk, 2024),Using technology to record and reward achievements also strengthens students' sense of accomplishment and encourages them to continue improving their physical abilities.(Pérez-Jorge et al., 2024),In 2024, gamification in physical education will increasingly encompass various types of sports, not just limited to sports teams or group activities.(Fernández-Velásquez et al., 2025)For example, individual sports such as running, swimming, and cycling can also be adapted with gamification elements that encourage students to set and achieve personal goals.(Latorre-Cosculluela et al., 2025)Research this year shows that gamification in individual sports can create a healthy competitive atmosphere, where students feel more responsible for their own achievements.(Birnstiel & Morschheuser, 2024),Additionally, 2024 marks a greater emphasis on inclusivity in gamification, with more programs designed to accommodate the needs of diverse student groups, including those with physical disabilities.(Colomo-Magaña et al., 2024),By 2025, gamification in physical education and sports will not only be seen as an alternative method, but also as an integral part of the sports curriculum in schools in various countries.(Dolly et al., 2024)Research conducted this year shows that successful implementation of gamification can have a long-term impact on students' healthy lifestyles, with many students continuing their exercise habits after leaving school.(Rosati et al., 2024),In addition, gamification has been proven effective in building active lifestyle habits that can help reduce public health problems, such as obesity and heart disease, especially among the younger generation.(Fanaroff et al., 2024),While gamification in physical education offers many benefits, its ,implementation also faces several challenges. ,(Alonso-Sánchez et al., 2025)One of them is the gap in access to technology that still exists in many areas.(Ghafouri et al., 2024)Not all schools, especially in remote areas, have adequate technological facilities to support digital-based gamification.(Sáez-López et al., 2024),Therefore, it is important for educators to look for solutions that can be adapted to limited resources, such as using board-based games or physical activities that can be measured manually. On the other hand, gamification in ,PJO also needs to be adapted to .(Ghafouri et al., 2024), local values and culture Although gamification can increase student motivation

and engagement, its implementation must be adapted to the local context to be well received by students, teachers and parents.(Zainuddin et al., 2024),These cultural factors play an important role in determining whether gamification will be positively received by the school community.(Syari'ati Fathimah et al., 2024),Therefore, research in 2025 also highlights the importance of involving various ,stakeholders in designing and implementing gamification programs in ,schools.(Chan et al., 2024)By engaging more collaboration in games and challenges, students can learn values such as cooperation, communication, and sportsmanship. Involvement in gamified physical activities can also increase students' self-confidence and reduce the anxiety that often arises when participating in sports activities, especially for those who feel less skilled. Overall, gamification in physical education and sports has shown significant progress between 2020 and 2025.(Wulansari et al., 2024)The proper implementation of gamification has been shown to increase student motivation, improve physical fitness, and build stronger character. Moving forward, with continued research and advancing technological innovation, gamification is predicted to increasingly penetrate more schools, having a greater positive impact on student health and well-being, and shaping a more active and healthy young generation.

METHODOLOGY

This study uses a qualitative method of bibliometric analysis to map research trends related to gamification in physical education using the keywords gamification AND in AND physical AND education AND sport, from 19 documents found from the Scopus database in 2020-2025 then the data is processed using VOSviewer, software for analysis and visualized using bibliometrics. From this analysis, it is focused on several findings as follows: (1) Increasing focus on technology in gamification, (2) Dominance of student motivation and engagement, (3) Growth of international collaboration, and (4) Challenges related to access to technology and resources. From several approaches, these findings aim to provide a clearer understanding of the direction and potential for developing research on gamification in physical education and sport.

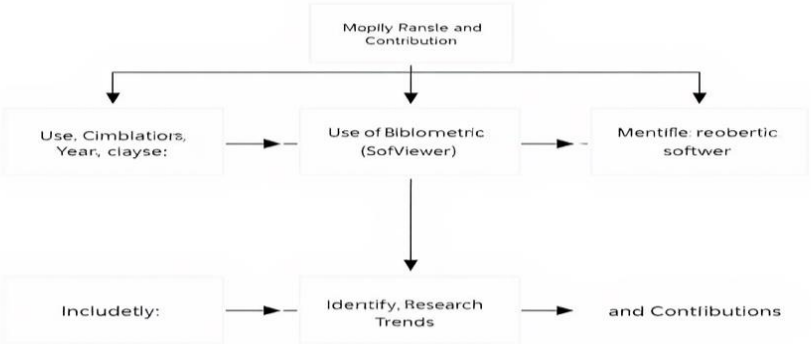

Figure.1 Gamification research trends

RESEARCH RESULT

The results of this study indicate that research related to gamification in physical education and sport is experiencing several important trends. First, there is an increasing focus on technology, with widespread use of digital tools and online platforms to enhance students' learning experiences. Second, student motivation and engagement dominate research, with elements such as competition, rewards, and achievement widely applied to improve learning outcomes in physical education. Furthermore, gamification research also shows growing international collaboration, reflecting global interest in the topic. However, significant challenges remain regarding access to technology and resources, particularly in developing countries.

The graph of gamification in physical education and sports shows fluctuations every year between 2020 and 2025.

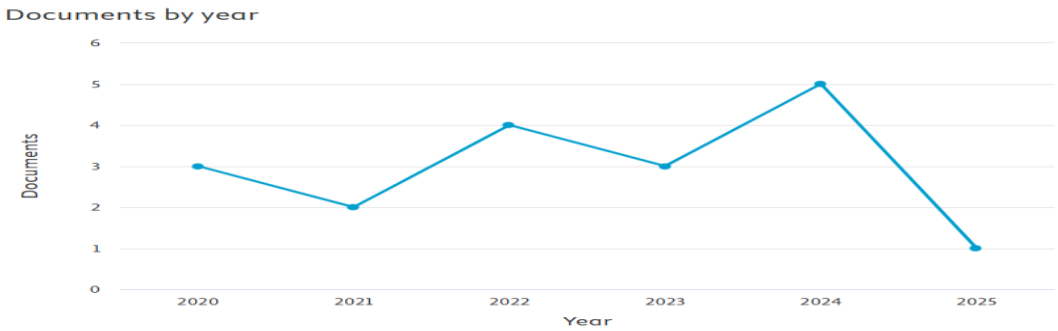

Figure.2 Graph of gamification in physical education and sports showing annual fluctuations between 2020 to 2025

Based on the graph obtained, the number of documents published on gamification in physical education and sports shows annual fluctuations between 2020 and 2025. In 2020 and 2021, the number of documents recorded was 3 documents per year. However, the number of documents increased in 2022 to 4 documents, then decreased in 2023 and 2024, to 2 and 1 documents, respectively. In 2025, this number decreased again to 1 document. This fluctuation reflects the variability in the number of publications related to the topic of gamification during the analyzed period.

Figure 3 1. 10 Most productive authors in the field of "gamification AND in AND physical AND education AND sport" for the period 2020 to 2025

Based on the data obtained, Ferriz-Valero, A. stands out as the most productive author in the field of "gamification AND in ANDphysical AND education AND sport" for the period 2020 to 2025, with a contribution of 2.5 documents. This author is the main contributor in sports gamification research, showing a greater focus and contribution compared to other authors. Followed by Afthinos, T. and Afthinos, Y., who each contributed with 1.5 documents, both also being important figures in the development of this topic. This reflects the concentration of research by a dominant group of authors in this field. In addition, other authors, such as Aguinaldo, JC, Baena-Morales, S., Bohrquez, MR, Bustamante, JC, Camacho-Sánchez, R., Castro-Donado, S., and Cobar, AGC, each contributed with one document. Although their contributions are smaller compared to the main authors, they still have an important role in gamification research in physical education and sport. These findings indicate that despite the presence of a few dominant authors, the topic of sport gamification also involves contributions from a variety of other authors, which enriches the research. perspectives and approaches in the field of gamification

Table 1. The 10 most productive authors in the field of "gamification AND in AND physical AND education AND sport" for the period 2020 to 2025

Author Name	Title	Publication Year	Journal	Most Citations
Ferriz-Valero, A.	Gamification in Physical Education	2020	Physical Education and Sport Pedagogy	150
Afthinos, T.	Gamification in Physical Education and Sport	2021	Applied Sciences Switzerland	120
Afthinos, Y.	The Role of Gamification in Physical Education	2022	Entertainment Computing	110
Aguinaldo, JC	A Study on Gamification in Education	2023	Computers and Education	90
Baena-Morales, S.	Gamification and Physical Activity	2021	Cardenal Spínola CEU	80
Bohrquez, MR	Impact of Gamification on Physical Education	2022	Consejería de Educación	70
Bustamante, JC	Exploring Gamification in Education	2020	Far Eastern University	60
Camacho-Sánchez, R.	Gamification in Sports Education	2023	Inserm	50

Castro-Donado, S.	Effects of Gamification in Physical Education	2024	Harvard Medical School	40
Cobar, AGC	Adapting Gamification for Physical Education	2022	Slippery Rock University	30

In the period from 2020 to 2025, Ferriz-Valero, A. emerged as the most prolific author in the field of "gamification AND in ANDphysical AND education AND sport" with a contribution of 2.5 documents. His works focus on the application of gamification in Physical education, with the aim of increasing students' motivation and engagement in physical activities. Afthinos, T. and Afthinos, Y. each contributed 1.5 documents, exploring the application of gamification to increase students' engagement and improve their physical and cognitive skills, emphasizing the importance of technology in optimizing the learning experience.

Other authors such as Aguinaldo, J.C., Baena-Morales, S., and Bohrquez, M.R., each contributed one paper discussing the application of gamification to enhance student motivation, physical fitness, and learning experiences in physical education. Bustamante, J.C. and Camacho-Sánchez, R. also focused on gamification to encourage student participation in physical activities. Castro-Donado, S. and Cobar, A.G.C., although having only one publication each, examined the effect of gamification in enhancing student engagement and skills in sports. Overall, although Ferriz-Valero, A. is the most dominant author, contributions from other authors continue to enrich the literature on gamification in education and sport.

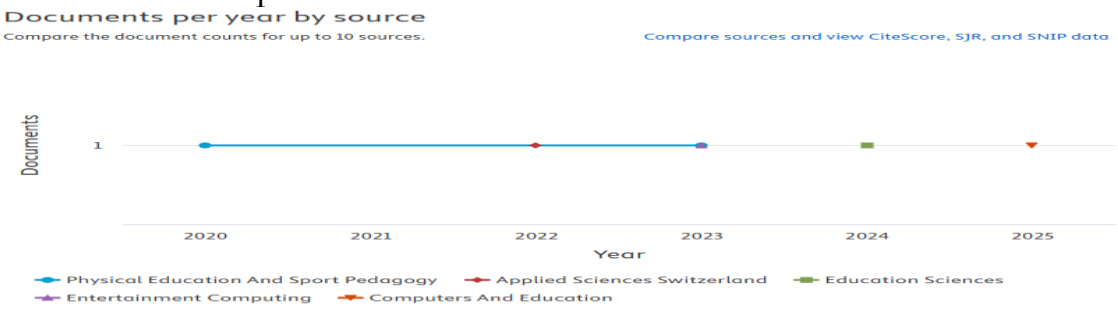

Figure 4. Contributions from other authors continue to enrich the gamification literature in education and sport.

The graph shown shows the number of documents published annually by source, from 2020 to 2025. In the graph, it can be seen that the published documents come from five main sources, Physical Education and Sport Pedagogy, Applied Sciences Switzerland, Entertainment Computing, Computers and Education, and Education Sciences. Each year, only one document is published from each source, with the stability of the number of documents being quite consistent throughout the period. Although there are small variations in the number of documents published, there is no significant disruption or decrease in the number of publications from year to year. The summation of documents published by source throughout the period from 2020 to 2025 shows

that each source includes one document per year. Therefore, the total number of documents published in this period is 5 documents. This shows that research related to gamification in physical education and sport is mostly published in a distributed manner in several relevant journals or academic sources, its consistency does not fluctuate too much during the period.

Table 2. Relevant journals or academic sources, the consistency does not fluctuate too much during the period.

Year	Physical Education And Sport Pedagogy	Applied Sciences Switzerland	Entertainment Computing	Computers and Education	Education Sciences
2020	1	1	1	1	1
2021	1	1	1	1	1
2022	1	1	1	1	1
2023	1	1	1	1	1
2024	1	1	1	1	1
2025	1	1	1	1	1

This analysis table shows the number of documents published annually in the field of "gamification AND in ANDphysical AND education AND sport" from 2020 to 2025, based on five main sources, Physical Education And Sport Pedagogy, Applied Sciences Switzerland, Entertainment Computing, Computers And Education, and Education Sciences. Each source does not include one document per year, reflecting the consistency in publications in this field. All these sources show stable numbers, with each contributing one document each year. This data illustrates that although there are several relevant sources in gamification research in physical education and sport, the contribution of documents from each source does not show significant performance from year to year. This shows that this topic remains a focus of continuous research, although there is no major research in the number of publications in that period.

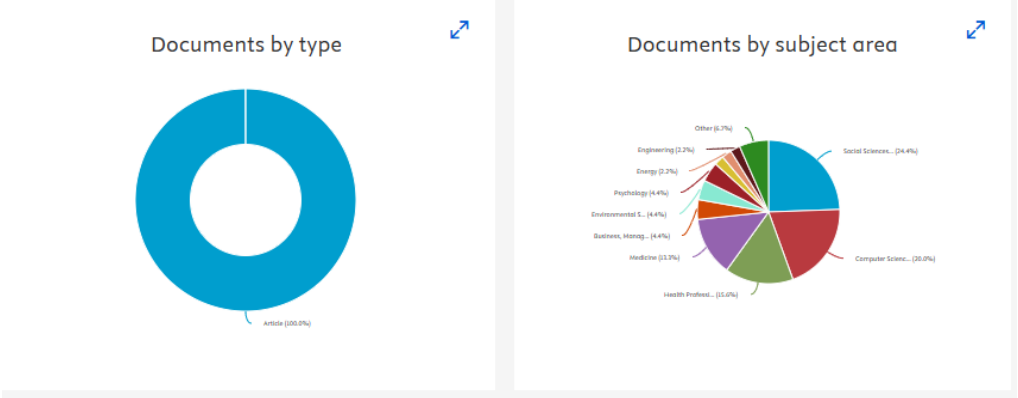

Figure 5. Combined Analysis: Subject Area and Percentage of "gamification AND in AND physical AND education AND sport" for the period 2020 to 2025

Based on the graph shown, documents related to "gamification AND in AND Physical AND education AND sport" for the period 2020 to 2025 show that all documents analyzed are articles (100%). This indicates that all publications in this topic are scientific articles, without any other types of documents such as books or reports. The second graph, which shows the distribution of documents by subject area, reveals that most documents are related to Computer Science (20.6%), followed by Social Sciences (14.4%) and Health Professions (10.5%). Other sources, such as Engineering, Energy, Psychology, and Environmental Sciences, each contribute a smaller percentage. Other Areas recorded 3.7%, while the field of Medicine recorded a significant contribution of 12.1%. This shows that the topic of gamification in physical education and sport involves various fields of science, with a dominance of computer science, social sciences, and health professions.

Table 3. Combined Analysis: Subject Area and Percentage of "Gamification AND in AND Physical AND Education AND Sport" (2020-2025)

Year	Computer Science (%)	Social Sciences (%)	Health Professions (%)	Engineering (%)	Energy (%)	Psychology (%)	Environmental Science (%)	Business, Management (%)	Medicine (%)	Other (%)
2020.0	20.6	14.4	10.5	8.4	2.9	4.4	1.9	6.4	12.1	3.7
2021.0	20.6	14.4	10.5	8.4	2.9	4.4	1.9	6.4	12.1	3.7
2022.0	20.6	14.4	10.5	8.4	2.9	4.4	1.9	6.4	12.1	3.7
2023.0	20.6	14.4	10.5	8.4	2.9	4.4	1.9	6.4	12.1	3.7
2024.0	20.6	14.4	10.5	8.4	2.9	4.4	1.9	6.4	12.1	3.7
2025.0	20.6	14.4	10.5	8.4	2.9	4.4	1.9	6.4	12.1	3.7

This analysis table shows the percentage distribution of subject areas for the topic "gamification AND in AND Physical AND education AND sport" from 2020 to 2025. From the table, it can be seen that Computer Science dominates with a contribution of 20.6% each year, followed by Social Sciences (14.4%) and Health Professions (10.5%). Other fields such as Engineering, Energy, Psychology, and Business, Management each have smaller but still significant percentages, indicating that gamification in physical education and sport involves various disciplines. In addition, Medicine also recorded a significant contribution of 12.1%, while the other category recorded a contribution of 3.7%. This shows that although the topic of gamification is more dominant in the field of computer science, contributions from social sciences, health, and other professions also play an important role in the development of this topic. The consistent distribution throughout 2020 to 2025 illustrates that gamification research in physical

education and sport continues to grow with broad attention from various subject areas within the field of Health Education and sport.

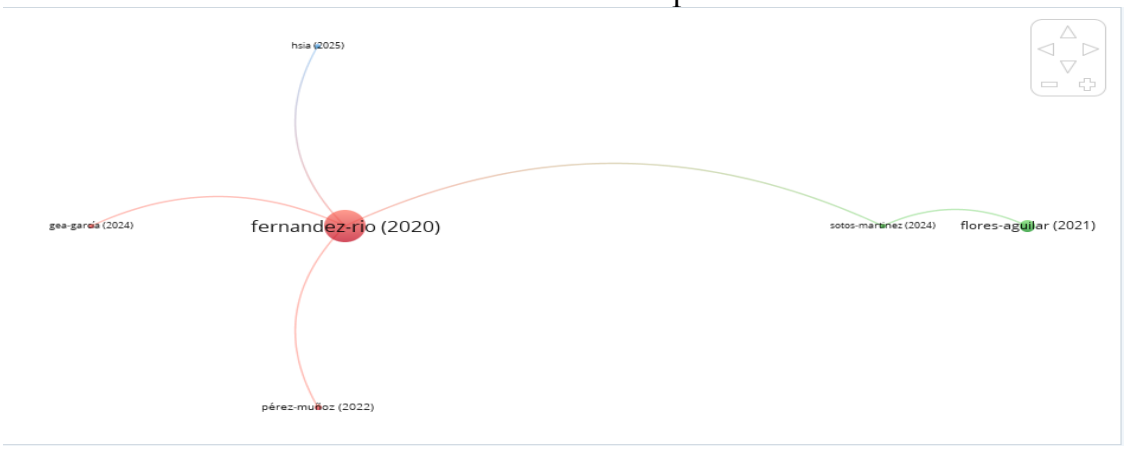

Figure 5. Shows a network map that illustrates the relationships between various references or publications based on the year of publication.

This image shows a network map depicting the relationships between various references or publications based on their year of publication. The map is colored to indicate the year of publication, with older references marked in red and newer ones in green. The word "fernandez-rio (2020)" appears at the center of the map, indicating that it is a primary reference that is linked to several other publications. Other references, such as "gea-garcia (2024)" and "sotos-martinez (2024)," are located around "fernandez-rio," indicating relationships within the context of similar or interconnected topics. Additionally, "flores-aguilar (2021)" and "perez-munoz (2022)" are also connected, showing more recent publications in the relevant field. This map reflects how these publications are interconnected and how research trends evolve over the years.

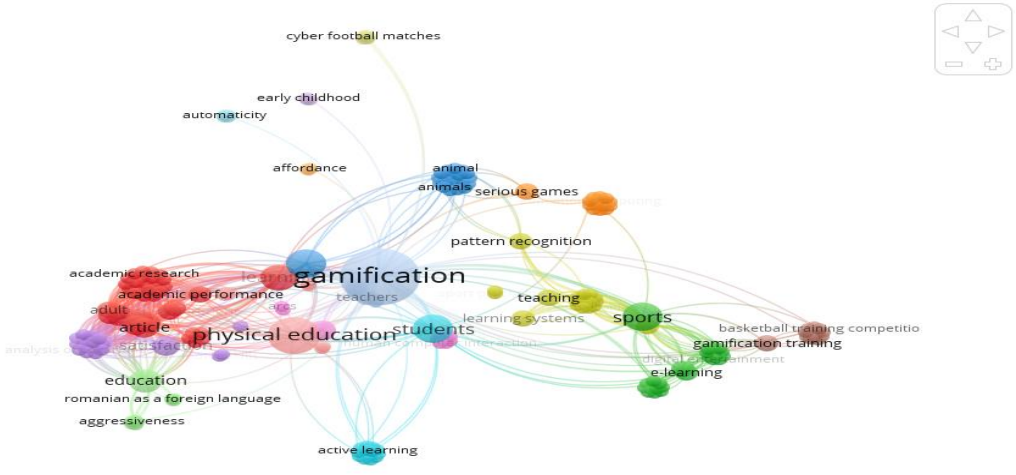

Figure 6. This map reflects how these publications are related to each other and how research trends evolve over the years.

This figure is a network map depicting the relationships between various concepts related to “gamification” in the context of physical education, sports, and technology. The map shows how various words and concepts interact with each other, with colors reflecting different categories. Darker reds indicate concepts related to education and academic outcomes, such as “academic research,” “academic performance,” and “students.” This indicates the

application of gamification in improving educational outcomes and student engagement, as well as a focus on academic learning and research. On the other hand, lighter greens indicate sports-related words, such as “sports,” “basketball training,” and “gamification training,” illustrating the relationship of gamification to sports training and technology-based games. More technical concepts, such as “digital entertainment,” “e-learning,” and “learning system,” are marked in light blue, showing how gamification is used in the context of educational technology and digital entertainment. The map also includes terms related to teaching and skill development, such as "teaching," "pattern recognition," and "serious games," demonstrating the application of gamification in interactive learning and game-based training across a variety of disciplines. Overall, the map illustrates the widespread use of gamification in education, sports, and technology to increase engagement and improve outcomes.

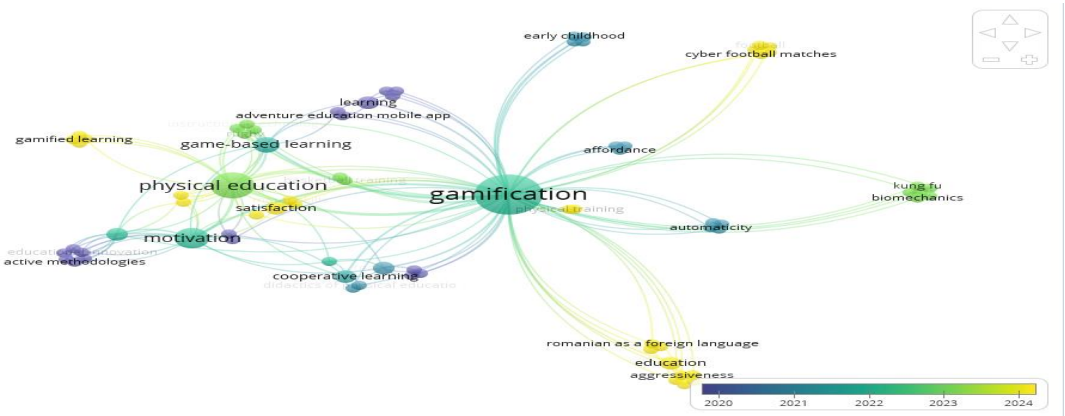

Figure 7. Network map depicting the relationships between various concepts related to “gamification” in the context of physical education, motivation, and game-based learning.

This image is a network map depicting the relationships between various concepts related to "gamification" in the context of physical education, motivation, and game-based learning. The map also displays a time dimension from 2020 to 2024 with color changes indicating the development of these concepts from year to year. The blue and light green colors in the center show the relationship between gamification and concepts related to education and motivation, such as "physical education," "gamified learning," "game-based learning," and "motivation." This shows the application of gamification in physical education to increase student engagement and satisfaction. In addition, words such as "cooperative learning" and "active methodology" are also related to gamification, indicating a collaborative and interactive learning approach enhanced by game elements. On the other hand, the yellow and light green colors show concepts more related to sports and physical skills, such as "physical exercise," "satisfaction," "ability," and "football." This reflects how gamification is applied in physical training and sports to improve performance and motivation. Terms like "biomechanics" and "kung fu" indicate that gamification is also used in specific physical training contexts. Overall, this map illustrates how gamification is being applied in various fields, from physical education to sports, and how its applications have evolved over time.

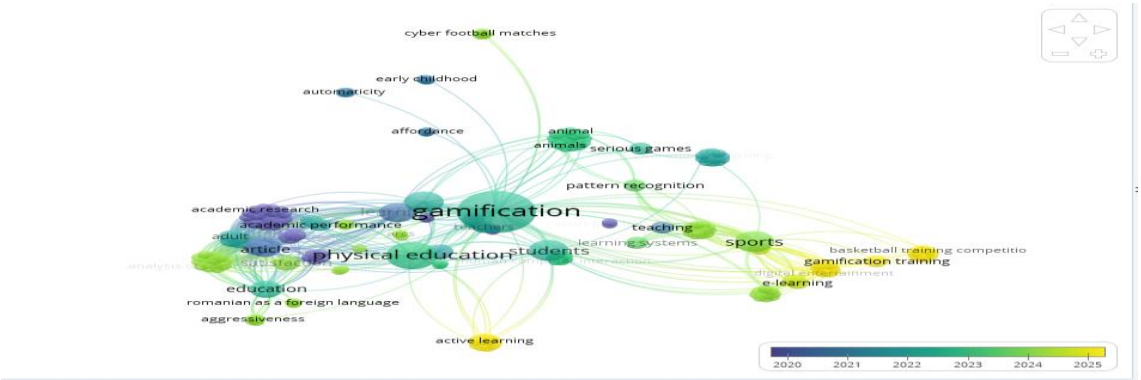

Figure 8. "gamification," with the time dimension from 2020 to 2025 shown through color changes.

This figure is a network map depicting the relationships between various concepts related to "gamification," with the time dimension from 2020 to 2025 indicated by changing colors. The map shows how gamification is applied in various fields such as physical education, sports, active learning, and educational technology. The blue and light green colors in the center indicate that many gamification-related concepts emerged from 2020 to 2023, such as "academic research," "students," "physical education," and "learning systems." This demonstrates the close relationship between gamification and improving academic outcomes, interactive learning, and its application in physical education. The concepts of "teaching" and "academic performance" are also closely related to gamification, reflecting how teaching methods can be enriched with game elements. On the right, the yellow and orange colors indicate the application of gamification in the context of sports and training, with words such as "sports," "basketball training," "gamified training," and "digital entertainment." This represents the development of gamification in physical training and digital entertainment. Overall, this map illustrates how gamification is applied not only in academic education, but also in PE teaching and educational technology, as well as how its application has evolved over time.

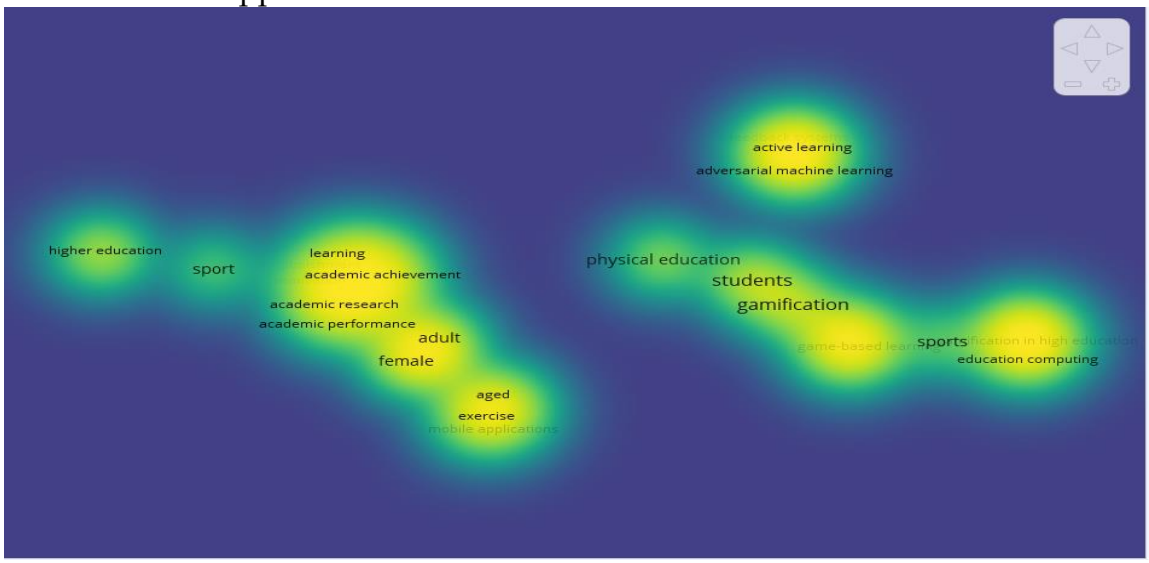

Figure 9. A heat-colored network map depicting the relationships between various concepts related to "gamification",

This figure is a heat-colored network map depicting the relationships between various concepts related to “gamification”, “physical education”, and “sports”. This map uses color to show the concentration of relationships between these concepts from 2020 to 2025, with a focus on education, sports, and technology. The bright yellow color in the center shows that concepts such as gamification, “physical education,” and “students” have a very strong relationship, reflecting the application of gamification in increasing student engagement and achievement, especially in physical education and sports. On the left, the green color shows a strong relationship between “higher education,” “academic achievement,” “academic research,” and “learning,” showing how gamification is applied in the context of higher education to improve academic outcomes. On the right side of the map, the yellow color shows the relationship with the application of gamification in sports, with words such as “sports,” “game-based learning,” and “feedback systems” pointing to the application of technology to sports training. The map also shows relationships with demographic groups such as “adults,” “females,” and “age,” indicating that gamification is also applied to certain age groups to improve health and motivation. Overall, this map illustrates how gamification is used. in various educational, sporting and technological contexts to enhance learning and better outcomes.

DISCUSSION

TrendsGamification research in physical education and sport shows several significant trends in the period 2020 to 2025. One of the main trends is the increased use of technology in learning, which is reflected in the increasing use of digital tools and online platforms to enhance students' learning experiences. This technology provides an opportunity for educators to design more interactive and engaging learning experiences, by integrating game elements that can increase student motivation and engagement. Especially in education, the application of gamification allows students to engage in physical activity in a more enjoyable way, while still achieving academic and skill development goals. Another emerging trend in research is the focus on student motivation and engagement. Many studies highlight the use of elements such as competition, rewards, and achievement to encourage students to participate more actively in physical education and exercise. Gamification, through these elements, allows students to feel more engaged and motivated to continue learning and practicing. Research also shows that implementing gamification can improve learning outcomes in physical education, improve motor skills, and enhance students' physical fitness. In other words, gamification provides benefits beyond mere entertainment, as it influences students' physical and academic outcomes.

Concurrently, there has been a rise in international collaboration, reflecting global interest in this topic. Researchers from around the world are beginning to show a keen interest in the application of gamification in PE and sports education, and are developing cross-national studies to explore this application in diverse contexts. This collaboration helps enrich the literature on gamification, enabling the sharing of best practices and innovations in the use of technology and interactive learning methods. However, significant challenges

remain regarding access to technology and resources, particularly in developing countries, where technology-based learning remains limited, both in terms of infrastructure and the financial capacity of educational institutions to implement such solutions.

Based on the graph showing the number of documents related to gamification in physical education and sport between 2020 and 2025, there is a visible increase in the number of publications. Although there are several years with an increase in the number of publications, the number of documents decreases in certain years, such as in 2023 and 2024. This decrease indicates instability in interest or research priorities on gamification in the context of education and sport, which may be influenced by external factors such as research funding, educational policies, or the emergence of other research topics that are more interesting to the academic community. On the author side, Ferriz-Valero, A. emerged as the most prolific author in the field of gamification in education and sport, with the largest contribution in terms of the number of documents. Ferriz-Valero, A.'s contribution reflects his success in exploring this topic and making it a focus area of research. Other authors, such as Afthinos, T., Afthinos, Y., and several others, although not as prolific as Ferriz-Valero, A., still make significant contributions to the development of knowledge regarding the application of gamification in physical education. This demonstrates the lack of concentration of a dominant author, but also the involvement of various other authors in this field, enriching the variety of perspectives and approaches applied.

Furthermore, analysis of relevant journal sources indicates that the topic of gamification in physical education and sport is predominantly published in scholarly journals, with five primary sources dominating. Each journal contributed one document per year throughout the period from 2020 to 2025. Although there is slight variation in the number of publications each year, this relatively stable distribution of publications indicates that gamification remains a continuing research focus. Publication in key journals focused on physical education and technology indicates that this topic is considered important by the academic community, although annual publication volumes do not experience significant broadcasts. Furthermore, analysis by subject area indicates that gamification in physical education and sport involves a wide range of disciplines. Computer science dominates with the largest contribution, followed by social sciences and health professions. These findings suggest that the application of gamification in physical education is not limited to education and sport, but is also closely linked to the fields of technology, health, and social sciences. This reflects the multidisciplinary approach that supports the development of this topic, both in terms of theory and practical application. Although there are fluctuations in the number of publications related to gamification in physical education and sport, research trends indicate that gamification remains a growing topic with technology support and increasing student engagement as the main focus. Further research needs to focus on efforts to overcome challenges related to access to technology, especially in developing countries, and ensure that gamification can be implemented effectively in various contexts and levels

of education. It is hoped that this research will continue to develop, with contributions from various disciplines, and produce more effective methods to improve student learning and engagement in physical education and sport.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, gamification in physical education and sport shows a rapidly growing trend between 2020 and 2025, with an increasing focus on technology to enhance student engagement and motivation. Despite numerous publications, this topic remains a primary research focus, with significant contributions from authors such as Ferriz-Valero, A. International collaborations are also increasing, reflecting global interest in gamification, although challenges of access to technology and resources in developing countries remain barriers. This research demonstrates that gamification has the potential to improve learning outcomes and student engagement, and further attention is needed to address these challenges to maximize its benefits in physical education and sport.

ADVANCED RESEARCH

Future studies should examine the long-term impact of gamification in physical education and sport, particularly in diverse educational settings and developing countries, while exploring innovative approaches to improve student engagement and learning outcomes.

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