

# Trends in scientific publication of traditional game learning models in physical education and sports in Indonesia: A bibliometric analysis

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# Trends in scientific publication of traditional game learning models in physical education and sports in Indonesia: A bibliometric analysis

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## ABSTRACT

The development of scientific publications in the field of traditional game learning models requires more research in order to compete with other fields. The goal of this research is to look at the production of scientific publications based on the traditional game learning model. The Scopus database and various bibliometric indicators such as global publication trends, most active authors, number of citations, and author keywords are used to collect publications. From 1996 to 2022, a total of 473 publications on traditional game learning models are discovered. Data in Comma-separated Values (CSV) and Research Information Systems (RIS) formats are exported to Microsoft Excel, Publish or Perish (PoP), and VOSViewer software for this review. According to the research findings, 2021 has been the year with the most publications, with 139 documents. Universitas Pendidikan Indonesia is listed as the most active affiliate, with up to 80 academic scientific works published. Suherman from Universitas Pendidikan Indonesia, is the most active writer, with 13 publications to his credit. With 60 documents, the Journal of Physics Conference Series is the most actively published scientific resource. Some of the research limitations in our paper include the selection of keywords that do not represent the entire search data, data filters, and data providers. It should be noted that a variety of other databases can be used to obtain data. This bibliometric study sheds light on future research directions in the field of traditional game learning models.

**Keywords:** Learning models; traditional games; bibliometric analysis; VOSViewer

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## INTRODUCTION

The primary goal of education and schooling is to teach students how to live in today's world, rather than to prepare them to lead useful lives (Chambers & Sandford, 2018; Dewey, 1938). All teachers, including those who teach physical education, must be prepared to work with students from a variety of backgrounds and

socioeconomic backgrounds (Shiver et al., 2020). With the push for lifelong learning and limited evidence in physical education, there is a need to advance the curriculum and learning models used in physical education in order to better meet the needs of today's learners (Ennis, 2017). Some argue that the lack of evolution in physical education fails to meet the needs of today's students, and they advocate for a curriculum redesign (Ennis, 2014, 2015). Through the language that is embedded in education, health, and child development, physical education has attempted to maintain a place in the school curriculum (Penney, 2000). Sport has traditionally shaped the subject matter through which physical education has attempted to achieve the curriculum's goals (Ward, 2014).

Children can develop their physical, intellectual, emotional, and social skills through play (Ardiyanto & Sukoco, 2014). Traditional games contain a lot of educational value (Putra et al., 2020). Aside from providing a context for the majority of learning related to children's lives, games also provide a context for children to learn about their own culture (Aypay, 2016). Even at the developmental level of young adults, children's games are so powerful and interesting that they are unforgettable (Chivandikwa et al., 2019). Each play's relationships help to build small, integrated communities of people who share emotions, beliefs, and responsibilities (Costes et al., 2021; McMillan & Chavis, 1986; Treitler et al., 2018). Games are the most effective way to educate children, and knowledge and skills acquired in the years before and during school are passed down through them (Gelisli & Yazici, 2015).

A learning model that emphasizes playing, having fun, and friendship, whether it is games, sports techniques, traditional games, or a combination of several games and sports, is an effective and appropriate learning model for the characteristics of elementary school children (Irmansyah et al., 2020). Sports have a huge potential to elicit strong emotions in those who participate (Lavega et al., 2017). Any game is a good experience in the context of physical education to encourage reflection-on-action learning about player actions, that is, to foster proactive reflection as meaningful learning for future physical education teachers (Lavega et al., 2018). Traditional games (e.g., hide and seek, tag, etc.) exhibit no level of organization at all (Martínez-Santos et al., 2020). Most traditional games necessitate advanced levels of fine and gross motor skills to be played competently (Tan et al., 2020).

Traditional games contain elements that can foster a child's creative spirit and intelligence (Yudiwinata & Handoyo, 2014). This game significantly fosters a playful and enjoyable environment, and it quickly becomes one of the students favorites (Chivandikwa et al., 2019). Traditional sports games are one of the primary languages of socialization in the context of informal learning (Costes et al., 2021). Children can develop their physical, intellectual, emotional, and social skills through play (Ardiyanto & Sukoco, 2014). Traditional games contain a lot of educational value (Putra et al., 2020). A kite is more than just a toy; it is also a work of art that can be flown and one of the nation's traditions that should be preserved (Putro & Hidayat, 2018).

Motor competence is emerging as an important marker of pre-existing health in childhood (Cattuzzo et al., 2016; Lloyd et al., 2014; Lubans et al., 2010; Pienaar et al., 2016). Identifying movement skill difficulties in children can be followed by the educational process required to fully develop movement skills (Kluwe et al., 2012; Miyahara & Clarkson, 2005). Motion education is a formal physical training curriculum that aims to improve a child's ability to use sensory input (especially but not exclusively visual) as a neurological prerequisite for standard forms of learning in schools (Danforth, 2011). Movement activity is clearly central to all levels of sport as well as movement-related aspects of physical education in schools (Light & Clarke, 2021). As a result, the teacher's role in the learning process and improving students motor skills is critical. Traditional direct teaching methods frequently emphasize memorization and regurgitation, whereas progressive models advocate for a more active reciprocal style from the teacher (Simonton et al., 2021; Sun et al., 2012). A physical education teacher's attention is thus directed to the mechanistic breakdown of body movements, where learning is narrowed down to the process of acquiring sport-specific techniques that, once perfected, can be applied to games (Rink, 2014). Children, on the other hand, are not always encouraged to explore the world in this manner (Llyod, 2012).

Implicit learning extends to motor skills in sports such as golf putts and free throws, which involve more complex movement structures and dynamics, according to research conducted over the last two decades (Steenbergen et al., 2010). This demonstrates physical education and sports researchers interest in motor skills,

particularly basic movement skills. Basic movement skills, such as locomotor skills (moving the body from one location to another, such as running and jumping), object control skills (transporting or intercepting objects, such as throwing and kicking), and balance skills (controlling the body in a stationary position and moving), are critical because they serve as the foundation for more advanced movement sequences (Kalaja et al., 2009) and facilitate successful participation in physical activity (Stodden et al., 2008; Vandorpe et al., 2012). This demonstrates the importance of learning physical education and sports in schools of all levels. Many studies conducted by experts in physical education and sports, however, show that students basic movement skills remain low. Many children aged 9-12 years old from various countries appear to have low proficiency in basic movement skills (Erwin & Castelli, 2008; Goodway et al., 2010; Hardy et al., 2012; Spessato et al., 2013; van Aart et al., 2015). The results show that traditional games are important for children's physical and psychological health (cognitive, emotional, and social aspects) (Siregar & Ilham, 2019); 2). Traditional games can evoke various types of emotions in participants according to the types of interactions allowed by the rule system (Lavega et al., 2014); 3). The use of traditional games in learning provides many benefits for children (Kovačević & Opić, 2014; Suherman et al., 2019); 4). Concrete traditional games in primary schools, which tend to increase students motivation, satisfaction, experience, and ultimately provide higher learning performance (Trajkovik et al., 2018).

As a result, the development of scientific publications related to traditional game learning models must be studied more thoroughly in order to compete with other fields. Our research employs bibliometric analysis to investigate critical ideas and publication trends in traditional game learning model research. This is significant because the bibliometric method provides a macroscopic summary of the vast scientific literature, which is required for proper decision making among experts on a specific issue. Bibliometric reviews of learning models have been conducted in a variety of disciplines and fields, including: the concept of games in digital learning environments (Schöbel et al., 2021), induced games (Baccini et al., 2019), the use of games in the production engineering area (Rosado & De Souza, 2021), incorporating adaptation in educational games (Liu et al., 2020), and gamification in education (Swacha, 2021).

The authors are particularly interested in aspects of research related to traditional game learning models in this bibliometric review, (1) to describe the descriptive parameters of publications such as the evolution of publications, leading sources, influential countries and institutions, and active authors; (2) to visualize citation patterns from academic work in the field of traditional game learning models; (3) to extract keywords and create maps that describe the citation patterns; and (4) to comprehend the significance and performance of scientific research in the field of traditional game learning models. This research helps academics who are interested in traditional game learning models, policymakers who want to design physical education and sports learning developments that are more in line with student needs and the times, and researchers who want to consider research patterns in traditional game learning model activities and identify potential future research opportunities.

## METHOD

The VOSViewer application is used in this study to conduct bibliometric analysis. A systematic search was conducted using the Scopus database in accordance with the purpose of this study. On February 26, 2022, the researcher used a phrase search to obtain the article's metadata. For the metadata search, the following terms were used: "traditional game" OR "learning model" OR "development model" OR "sport" OR "physical education". All terms are searched using the Article Title database, and only Indonesia is selected as a country affiliation. The procedure for collecting Scopus documents, which will then be analyzed, is depicted in Figure 1.

The primary goal of this bibliometric review is to examine the trend of publications in the Scopus database related to the traditional game learning model. Using the document checking approach in the Scopus database, the investigation was completed in the context of descriptive analysis. Scopus was chosen because it contains more documents than Web of Science and Pubmed (Sweile et al., 2017) and has been frequently cited in previous studies (Khiste & Paithantar, 2017). In bibliometric analysis, the total amount of metadata that must be met in order to be studied varies substantially. The number of metadata numbers that can be used for

bibliometric analysis, as well as the minimum and maximum metadata standards that can be evaluated, are not stated (Sofyan, 2022).

From 1996 to 2022, the Scopus database contained 473 publications on traditional game learning models. For further analysis, this review employs data in Comma-separated Values (CSV) and Research Information Systems (RIS) formats exported to Microsoft Excel, Publish or Perish (PoP), and VOSViewer software (Abdullah, 2021). VOSViewer employs visual elements based on mapping techniques to convert CSV data into diagrams or clusters (Abdullah & Abd Aziz, 2021; van Eck & Waltman, 2010, 2021). The information gathered includes the author's name, the source of the document, the year of publication, the title of the publication, the journal, the subject field, and the type of publication. The authors of this review acknowledge and caution about probable author name similarity, which is one of the limits of bibliometric studies (Sofyan & Abdullah, 2022). Mapping techniques are also frequently used to assist researchers in evaluating relevant information such as author, location, organization, citation, co-citation, and other refinement aspects (Khalil & Crawford, 2015).

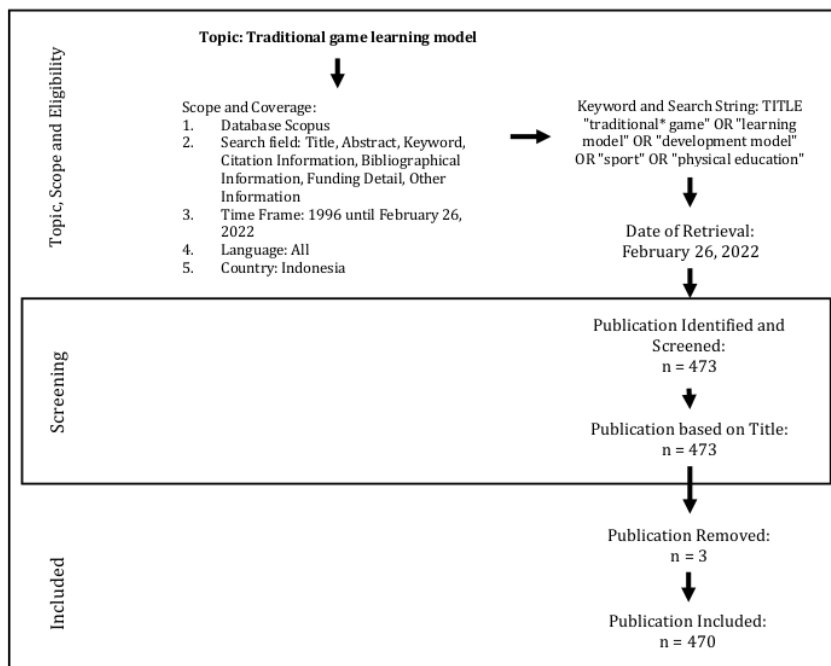


Figure 1 Depicts the Selection Strategy and Research Protocol

## RESULTS AND DISCUSSION

From 1996 to 2022, 473 publications were found in the Scopus database (as of 26 February 2022). There are, however, three double documents, one conference paper and two article manuscripts. As a result, we examined 470 pieces of metadata. Table 1 describes the document types and languages used in 470 documents related to the traditional game learning model.

**Table 1. Document Type and Language**

Document type	Record count	%	Language	Record count	%
Article	314	66.80	English	467	99.37
Conference Paper	145	25.43	Indonesian	3	0.63
Review	6	1.27			
Book Chapter	3	0.63			
Editorial	1	0.21			
Letter	1	0.21			
Total record count	470		Total record count	470	

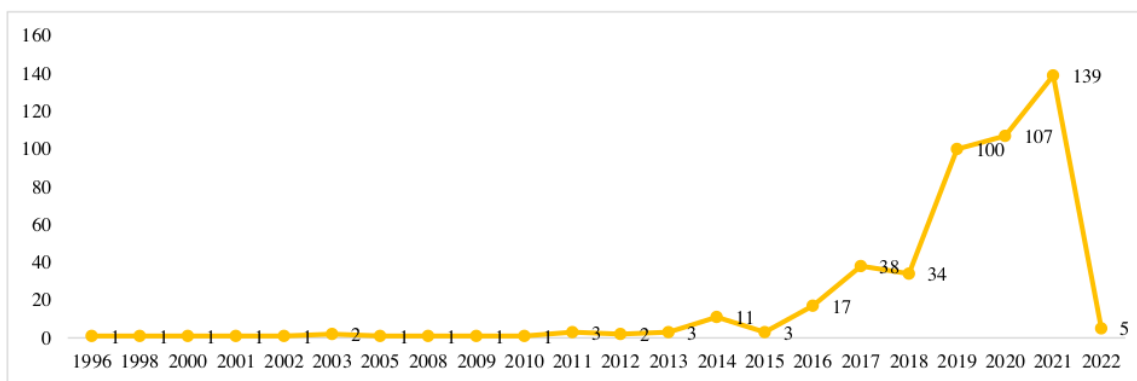
Furthermore, based on the publication stage, it was determined that 469 (99.78%) documents were in the final stage and 1 (0.22%) documents were in the article in press stage. Table 2 also describes the areas of active research on the traditional model of learning to play games. In addition, table 2 describes the subject area of active research on the traditional model of learning to play a game.

**Table 2. Subject Areas Related to the Publication of Traditional Game Learning Models**

Document Type	Record Count	Language	Record Count
Medicine	161	Economics, Econometrics and Finance	19
Social Sciences	134	Mathematics	16
Engineering	80	Agricultural and Biological Sciences	17
Health Professions	68	Psychology	16
Physics and Astronomy	65	Earth and Planetary Sciences	14
Computer Science	52	Energy	13
Biochemistry, Genetics and Molecular Biology	47	Decision Sciences	11
Business, Management and Accounting	41	Pharmacology, Toxicology and Pharmaceutics	10
Materials Science	37	Chemical Engineering	5
Environmental Science	31	Chemistry	5
Nursing	31	Multidisciplinary	4
Arts and Humanities	21	Neuroscience	2

**Trends in Publication**

The following section describes the findings of a bibliometric review of the 470 documents discovered between 1996 and 2022 (as of 26 February 2022). The highest number of publications was achieved in 2021, with 139 (29.57%) documents. The results of research conducted by researchers who are involved in publishing research documents demonstrate the growth of publications from the Indonesian region. Figure 2 depicts the publication trend from 1996 to 2022.



**Figure 2. The Publication Trend of Traditional Game Learning Models from 1996 To 2022 (until February 26, 2022)**

### The Top Ten Institutions in Terms of Activity

This review also took into account institutional involvement in sport in universities, based on at least eight institutions and a minimum of 50 documents. Researchers from a variety of academic institutions contributed to the publication of the selected articles. With 80 (12.30%) published documents, Universitas Pendidikan Indonesia is the most productive in this field, followed by Yogyakarta State University with 47 (7.23 %) published documents. Table 3 shows the eight most active institutions/organizations. With an emphasis on UPI as an educational institution that focuses on the teaching and learning process at school, Universitas Pendidikan Indonesia (UPI) is at the forefront of traditional game research and publication. This motivates lecturers to perform research on traditional games in order to develop physical education and sports learning models. As an option for improving kids mobility abilities.

Table 3. The Top Ten Institutions in Terms of Activity

13	Affiliation	City	Document	%
	Universitas Pendidikan Indonesia	Bandung, Jawa Barat	80	12.30
	Universitas Negeri Yogyakarta	Sleman, DIY	47	7.23
	Universitas Negeri Jakarta	Jakarta Timur, DKI Jakarta	35	5.38
	Universitas Indonesia	Depok, Jawa Barat	24	3.69
	Universitas Airlangga	Surabaya, Jawa Timur	22	3.38
	Universitas Gadjah Mada	Sleman, DIY	19	2.92
13	Universitas Sriwijaya	Palembang, Sumatera Selatan	16	2.46
	Universitas Negeri Surabaya	Surabaya, Jawa Timur	14	2.15
	Universitas Negeri Medan	Medan, Sumatera Utara	14	2.15
	Universitas Negeri Semarang	Semarang, Jawa Tengah	13	2.00

### Most Active Author

There were 470 Scopus documents in the field of traditional game learning models published between 1996 and 2022. Academic advances in digital technology have simplified the creation of inventions. As a result, this study looked into the authors by conducting a review of the most active authors. Table 3 shows the authors who contributed the most to the literature based on the number of publications. Suherman with a total of 13 publications, is the author with the most publications. Suherman is a professor of physical education curriculum and sports pedagogy. He focuses on how the teaching and learning process can improve children's abilities through traditional games and by introducing local wisdom. Because traditional games must be preserved, he designed how traditional games are included in teaching materials. Table 4 shows the additional writers who have at least six papers published.

Table 4. The Seven Most Active Authors

Author	Document	Affiliation
Suherman, A.	13	Universitas Pendidikan Indonesia
Sultoni, K.	8	Universitas Pendidikan Indonesia
Jalaludin, M.Y.	6	University Malaya
Ma'mun, A.	6	Universitas Pendidikan Indonesia
Nur, L.	6	Universitas Pendidikan Indonesia
Sinaga, F.A.	6	Universitas Negeri Medan
Tangkudung, J.	6	Universitas Negeri Jakarta

### The Most Popular Scientific Sources

Table 5 lists the titles of the most influential scientific sources in the field of traditional game learning models. The table shows that there have been publications in the field of traditional game learning models. This study discovered that "Journal of Physics Conference Series", with publishers from IOP Publishing Ltd., United Kingdom, became the journal that contributed the most in the field of traditional game learning models with 60 document. Table 5 contains information about other journals that publish a minimum of 7 documents in the field of traditional game learning models.

Table 5. Most Active Scientific Sources

Source	Document	Publisher
Journal of Physics Conference Series	60	IOP Publishing Ltd.
International Journal of Human Movement and Sports Sciences	38	Horizon Research Publishing
IOP Conference Series Materials Science and Engineering	33	IOP Publishing Ltd.
Indian Journal of Public Health Research and Development	11	Institute of Medico-Legal Publications
Open Access Macedonian Journal of Medical Sciences	11	Macedonian Journal of Medical Sciences
Cakrawala Pendidikan	10	Universitas Negeri Yogyakarta
Journal of Physical Education and Sport	10	Editura Universitatea din Pitesti
Asian Social Science	9	Canadian Center of Science and Education
IOP Conference Series Earth and Environmental Science	9	IOP Publishing Ltd.
Pakistan Journal of Nutrition	7	Asian Network for Scientific Information

Top-Referenced Articles

With 70 citations, Al Ayubi, Parmanto, Branch, and Ding (2014) received the most citations in their article “A persuasive and social health application for physical activity: A usability and feasibility study”. In the journal “JMIR mHealth and uHealth” with the publisher JMIR Publications Inc., Canada. With 49 citations, the second most cited publication is a study titled “Effects of an energy and micronutrient supplement on iron deficiency anemia, physical activity, and motor and mental development in undernourished children in Indonesia” by Harahap et al. (2000) Both of these publications can be used by a researcher in the future to conduct research.

Table 6. The Top Ten Citations

Cite	Auhtor	Title	Year
70	S.U. Al Ayubi, B. Parmanto, R. Branch, D. Ding	A persuasive and social mhealth application for physical activity: A usability and feasibility study	2014
49	H. Harahap, A.B. Jahari, M.A. Husaini, C. Saco-Pollitt, E. Pollitt	Effects of an energy and micronutrient supplement on iron deficiency anemia, physical activity and motor and mental development in undernourished children in Indonesia	2000
39	R.C.I. Prahmana, Zulkardi, Y. Hartono	Learning multiplication using Indonesian traditional game in third grade	2012
36	S. Sukendro, A. Habibi, K. Khaeruddin, B. Indrayana, S. Syahrudin, F.A. Makadada, H. Hakim	Using an extended Technology Acceptance Model to understand students' use of e-learning during Covid-19: Indonesian sport science education context	2020
25	A. Lim, R. Pranata	Sports activities during any pandemic lockdown	2021
25	L.C.W. Lam, P.A. Ong, Y. Dikot, Y. Sofiatin, H. Wang, M. Zhao, W. Li, J. Dominguez, B. Natividad, S. Yusoff, J.-L. Fu, V. Senanarong, A.W.T. Fung, K. Lai	Intellectual and physical activities, but not social activities, are associated with better global cognition: A multi-site evaluation of the cognition and lifestyle activity study for seniors in Asia (CLASSA)	2015
23	J.D. Goodway, R. Famelia, S. Bakhtiar	Future directions in physical education & sport: Developing fundamental motor competence in the early years is paramount to lifelong physical activity	2014
23	M.C.-H. Wang, J.M.-S. Cheng, B.M. Puoyanto, K. Erimurti	The determinants of the sports team sponsor's brand equity: A cross-country comparison in Asia	2011
21	S. Mohammadi, M.Y. Jalaludin, T.T. Su, M. Dahlui, M.N.A. Mohamed, H.A. Majid	Determinants of diet and physical activity in Malaysian adolescents: A systematic review	2019
21	M. Ruslin, P. Boffano, Y.J.D. Ten Brincke, T. Forouzanfar, H.S. Brand	Sport-related maxillofacial fractures	2016

The Most Frequently Discovered Terms

A total of 37 keyword terms with at least three occurrences were discovered, divided into nine clusters. Cluster 1: education, games, learning models, multimedia, social skills, traditional games, and traditional sports; Cluster 2: adolescence, screen time, sedentary behavior, social media; Cluster 3: age, physical activity, quality of life, systematic review; Cluster 4: achievement, motivation, sport; Cluster 5: covid-19, distance learning; Cluster 6: energy intake, overweight; Cluster 7: diabetes mellitus, smoking; Cluster 8: adolescent;



and Cluster 9: dietary intake. The author's favorite keyword is “physical activity”. This is due to the fact that traditional games are linked to student movement in the classroom. How traditional games included in educational materials might help pupils become more engaged in their studies. Because one sign of learning achievement is students' enthusiastic engagement in class. Figure 3 depicts the keyword terms as displayed by VOSViewer.

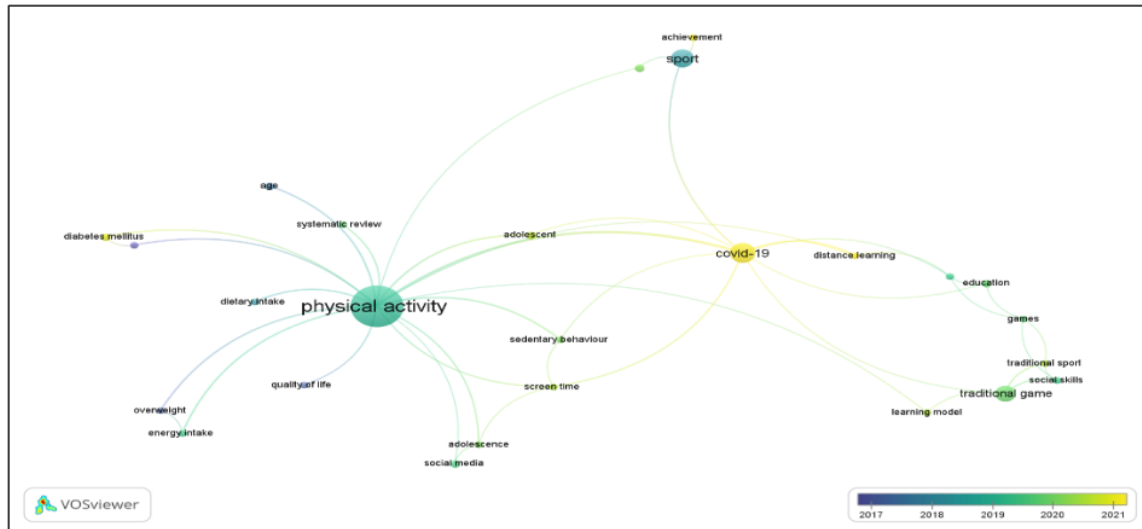


Figure 3. Terms that Appear Frequently in Traditional Game Publications

“Achievement”, “covid-19”, “diabetes mellitus”, and “distance learning” are the most recent keywords. This demonstrates that the most recent keyword terms in the traditional game learning model are an important concept in research development. The main themes or keywords associated with the traditional game learning model were identified in this study. As a result, based on the growth trends of publications and the authors keywords, this bibliometric analysis can generate proposals for future research. These elements are required for future researchers to outline the background or address broad concerns raised by previous research in the field of traditional game learning models. Other methodologies or reviews, such as narrative reviews, scoping reviews, systematic literature reviews, or meta-analyses, may also be used to describe the relationships discovered in the study.

More research should be done to determine the trend of publication of traditional game learning models in relation to interventions in specific target groups. As a result, the traditional progressive game learning model is frequently an important aspect of the sustainability of the teaching and learning process in schools, as well as a vehicle for school promotion. As a result of these bibliometric findings, readers, educators, and researchers will be able to better identify important information in their future studies to assess the value of vocational education.

## CONCLUSION

As new trends emerge, this bibliometric review encourages the examination and integration of established directions in traditional higher game learning models. Based on a 26-year bibliometric review of traditional game learning model publications, the researchers discovered that the information in this study provided readers, education practitioners, sports practitioners, and researchers with a more realistic reality.

Indeed, bibliometric studies can project or provide insight into the state of the art in a specific field or subject. Aside from the useful information provided by this paper, some limitations should be highlighted to assist future readers and researchers in better understanding. This study relies solely on documents from the Scopus database as its primary source. Additional databases that may be useful for bibliometric review include

Google Scholar, Dimensions, Microsoft Academic, and Web of Science (WoS). In addition, prospective researchers will use other software programs such as the R package, BibExcel, CiteSpace, and SciMAT to visualize large amounts of data in a variety of situations.

We discovered significant findings in this manuscript, which corresponds to the increasing number of research developments and publications related to traditional game learning models in an academic context in recent years. However, there is still a scarcity of research on traditional game learning models. Of course, this is a challenge for researchers to conduct additional studies on traditional games using bibliometric analysis.

More research should be done to determine the trend of publication of traditional game learning models in relation to interventions in specific target groups. As a result, the traditional progressive game learning model is frequently an important aspect of the sustainability of the teaching and learning process in schools, as well as a vehicle for school promotion. As a result of these bibliometric findings, readers, educators, and researchers will be able to better identify important information in their future studies to assess the value of vocational education.

### CONFLICT OF INTEREST

This study contains no conflicts of interest.

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