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Evaluation of learning in physical education: A bibliometric analysis and future trends

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ABSTRACT

This study analyzes academic research published in Scopus on the evaluation of physical education learning. This study focuses on the following research questions: (1) How is the productivity of educational evaluation publications in physical education developed using the Scopus database? (2) What are the most influential journals, authors, and articles in the field of educational evaluation in physical education learning? (3) What are the keywords that often appear in the field of educational evaluation in physical education learning in the Scopus database?. The search results show that research is "evaluation" AND "learning" AND "physical education". Search Results (515 result documents) which began to be published in the Scopus database from 2011-2021. Furthermore, the researchers filter the types of documents which are only limited to journal articles, so the number of documents found is 188 documents. Based on publications in the Scopus database, the findings reveal that: the number of publications is increasing, although there is an up and down trend from year to year; most publications are written by researchers residing in several states and universities. From the emergence of keywords, the topic of assessment evaluation in physical education becomes an interesting thing to discuss. This analysis can provide knowledge about research development in aspects of evaluation and physical education and can be a source of data for teachers, lecturers, schools, universities, and the world of education. For future researchers, they can map these points by analyzing the databases of Website of Science and other publishers. Further researchers can also carry out scientometric analysis by combining two databases (Scopus and WoS) using ScientoPy and can continue with mapping until the end of 2022 and can also be a reference by seeing what points are interesting and have not been reviewed by previous researchers.

Keywords: Evaluation; learning; physical education; bibliometrics, scopus

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Authors' Contribution: a – Study Design; b – Data Collection; c – Statistical Analysis; d – Manuscript Preparation; e – Funds Collection

INTRODUCTION

Analysis of the evidence shows that physical education has the potential to make a contribution to young society in the development of skills and physical skills, in addition to positive benefits such as leadership,

involvement of young people in decision making, emphasis on social relationships, and an explicit focus on the learning process (Solmon et al., 2020). In the affective domain as well, involvement in physical activity is positively related to various dimensions of psychological and emotional development (Bailey et al., 2009; Carlson et al., 2013). In line with that, the purpose of learning physical education is to develop knowledge, skills, and understanding and to develop physical activity and competence and encourage participation in sports (Fischetti & Greco, 2017; Pfledderer & Brusseau, 2021). In the process of learning physical education, an evaluation of learning is needed to see how far the learning objectives have been achieved (Wardhana et al., 2017).

Learning evaluation includes measurement and assessment activities on the progress of student learning outcomes (Fitrianti, 2018). With good assessment of learning outcomes, so that it can be known the level of development of students' practice, their weaknesses, and their advantages. Evaluation of good practice results will be feedback for teachers to assess the level of success of teaching and learning methods. Through assessment, educators can better guide their students to achieve maximum learning outcomes, both of from the cognitive, affective, or psychomotor aspects (Ayuso et al., 2018). There have been many researchers from various countries who have studied educational evaluation in physical education learning, such as research on the application of computer artificial intelligence in student sports independent learning (Ge et al., 2018), hybrid kernel extreme learning for evaluating athletes' competitive abilities (Yanpeng, 2019). Evaluation of a constructivist learning environment for prospective physical education teachers (Ozgul et al., 2018), the effect of instructional self-talk on young swimmer backstroke learning (Zetou et al., 2014).

The development of evaluation studies in physical education learning is very little, especially in the Scopus database. Although previous studies have discussed evaluations in physical education, namely evaluating the quality of physical education teaching at universities (Zeng, 2020), evaluating the relationship between physical education, sports and social inclusion (Bailey, 2005), and evaluating the sustainability of physical education SPARK (Dowda et al., 2005). However, there are no researchers who use bibliometric analysis of evaluation in physical education learning. In this way, the researcher opens a perspective for future research by providing an objective and up-to-date literature overview on evaluation in physical education learning based on bibliometric analysis and visualization. The author fulfills the wishes of teachers, and sports practitioners to obtain up-to-date and documented information in order to improve ideas for their future research. This bibliometric research describes objective data and is expected to map aspects of the research, thus enabling a wider scope of the desired research (Hernández-Torrano et al., 2020). According to Van Eck and Waltman (2010, 2019), VOSviewer uses visual elements based on mapping techniques to convert CSV data into diagrams or clusters.

Therefore, this study aims to examine the development of scientific publications and map evaluation research in physical education learning. The research process is focused on the formulation of research problems as follows: How does the productivity of evaluation publications in physical education learning develop using the Scopus database? What are the most influential journals, authors, and articles in the field of evaluation in physical education learning? And what are the keywords that often appear in the field of evaluation in physical education learning in the Scopus database?.

METHOD

For the purpose of this study, a systematic search is carried out in the Scopus database which includes high-quality scientific research from more than 250 disciplines, social sciences, and humanities (Cretu & Morandau, 2020). Data are obtained through metadata articles. Researchers conducted a search through the Scopus database on October 13, 2021 with the search titles “evaluation” AND “physical education” AND “learning”. The results show that the study of "evaluation" AND "physical education" AND "learning" a number of articles results I (515 result documents) search articles in the Scopus database. Then the researchers only focused on the field of evaluation of physical education learning. So that 188 articles were found in the Scopus database from 2011-2021. Key contributor researchers (author, university, and source name), apply keyword occurrence analysis to find out publication trends, and track the main themes or

topics that appear in the publication. To present the data, the researchers use data visualization with the help of the VOSViewer application (Van Eck & Waltman, 2010). The researchers use several parameters in VOSViewer to get metadata articles, including: 1) Co-occurrence analysis, 2) All keywords, 3) Complete counting, and 4) Minimum number of author documents (one document) (Hanief et al., 2021; Jeong & Koo, 2016).

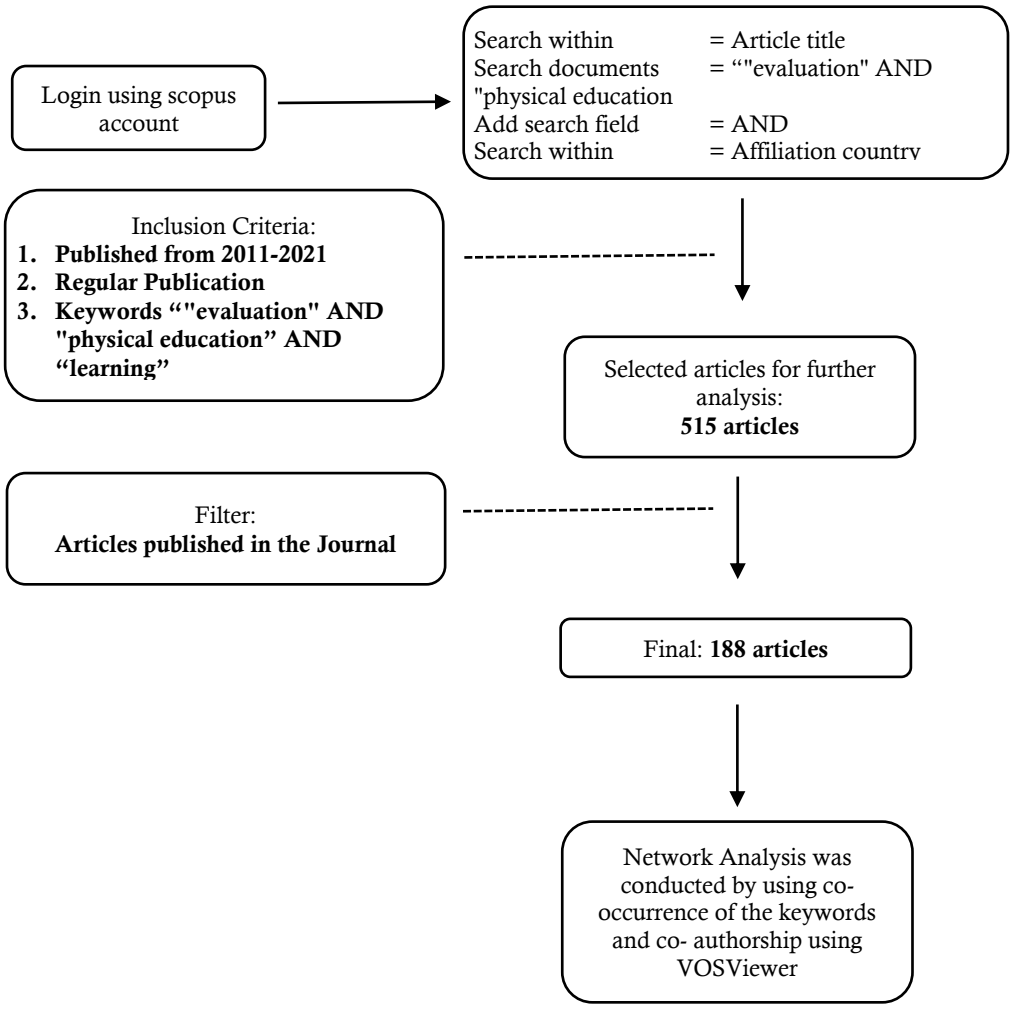

Figure 1. Article Metadata Search Design Method from Scopus Database

RESULTS AND DISCUSSION

This section contains the results of the bibliometric analysis according to the research question. First, it presents a survey of the literature centered on its evolution over time, and the participation of publications covering countries, organizations, types of documents. Second, review articles/journals that are very influential, well-known and widely cited researchers, and articles cited in scientific papers. Third, we look at the analysis of collaboration patterns between authors and countries using co-authorship analysis, on existing connections between authors or journals using co-citation analysis, and between terms or keywords using co-word analysis.

1. How does the productivity of evaluation publications in physical education learning develop using the Scopus database?

Based on the articles found in the Scopus database starting from 2011-2021, the trend of publications on the topic of evaluation of physical education learning has an up-down trend, and can be broken down as

follows: From 2011-2021 there were three times the number of articles decreased. The first starts from 2012-2013, 2015 and 2020. A significant increase in the number of articles will occur in 2021 with 25 articles. Interestingly, in the previous year there is a drastic decrease in the number of articles (8 articles).This decline may be due to the impact of the COVID-19 pandemic, and the number of researchers in various countries having difficulty conducting research on this topic. The dynamics of changes in publication productivity can be seen in Figure 2.

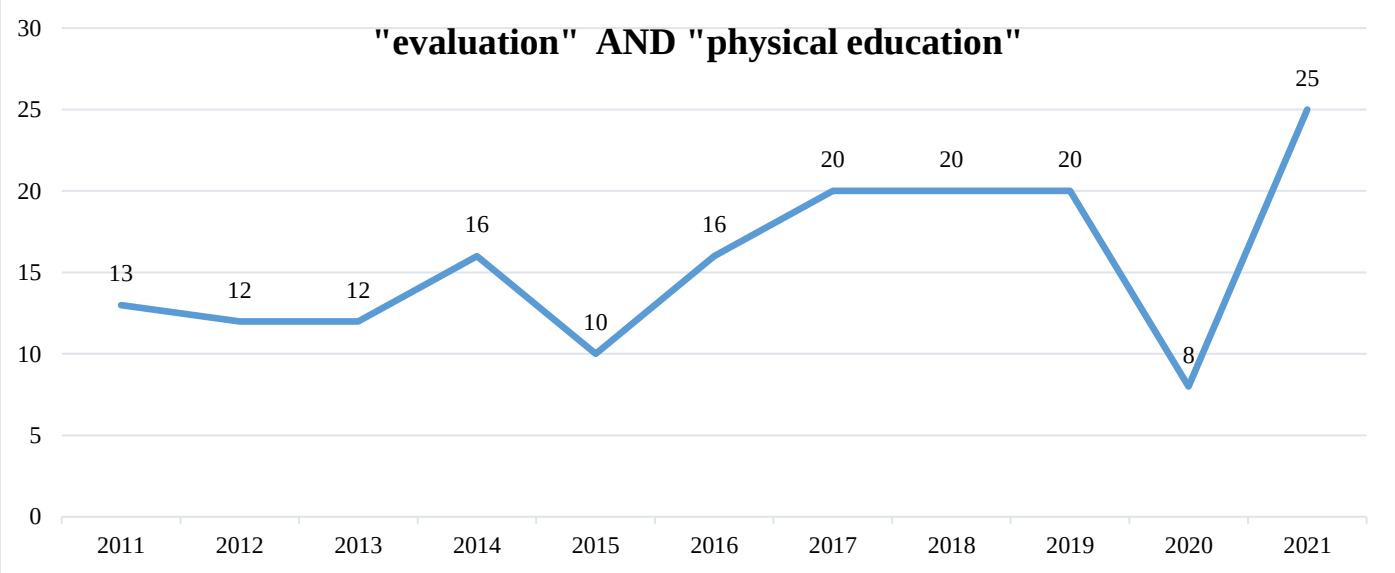

Figure 2. Productivity of Scientific Publications Titled "Evaluation" AND "Physical Education" from 2011 – 2021
Source: Research Data Taken from Scopus Database

2. What are the most influential journals, authors, and articles in the field of evaluation in physical education learning?

Research articles published in the Scopus database are 188 articles. The articles published in these various journals have different impacts, the influence can be seen from the large number of journal citations, authors, and article titles. Next, the impact of each journal, author, and post title is explained in terms of evaluation and physical education.

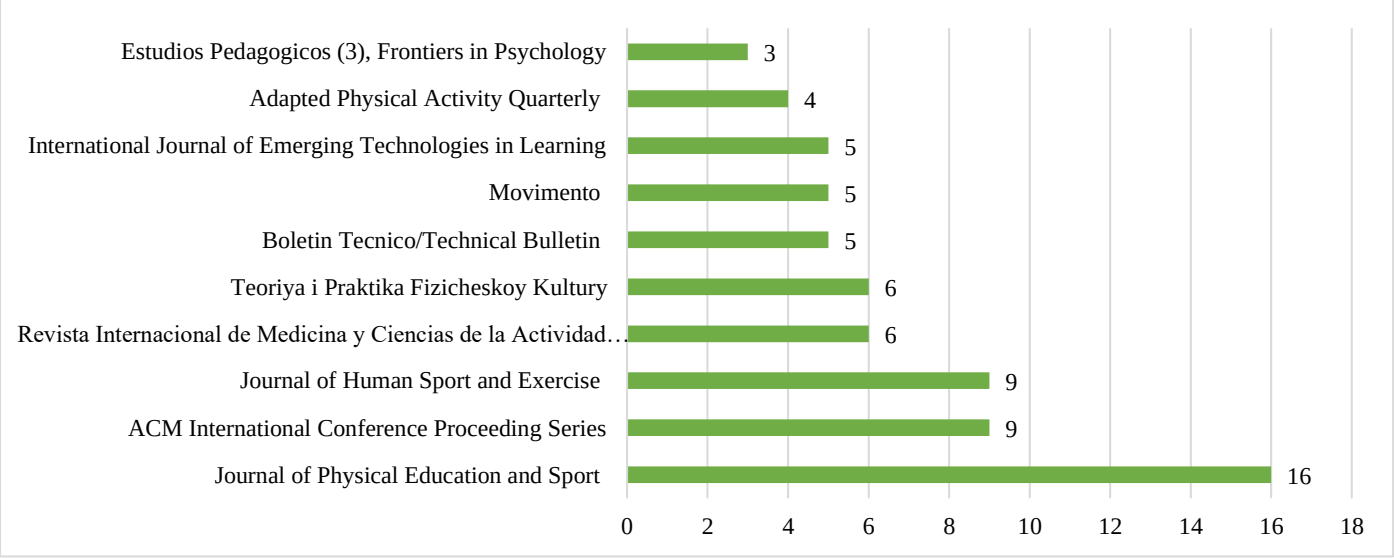

Figure 3. Top 10 Journals Including "Evaluation" AND "Physical Education" Documents Indexed in Scopus
Source: Research Data Taken from Scopus Database

Figure 2 presents the top 10 journals in terms of the number of articles published in the “evaluation” AND “physical education” areas. Of the 10 identified, the 3 best rankings are (1) Journal of Physical Education and Sport (16 Articles), (2) ACM International Conference Proceeding Series (9 Articles), (3) Journal of Human Sport and Exercise (9 Articles). While Figure 3 presents the top 10 journals in terms of the number of sources cited in the fields of “evaluation” AND “physical education”. Of the 10 identified, 1 journal has a very big influence, namely the Internet and Higher Education which is ranked first with 265 citations.

Table 1. Top 10 Journals Cited in “Evaluation" AND "Physical Education”

Journal	Citations
Internet and Higher Education	265
Teaching and Teacher Education	80
Gender and Education	42
Journal of Human Sport and Exercise	38
Journal of Physical Education and Sport	34
IEEE Transactions on Learning Technologies	32
Educational Review	26
Conference on Human Factors in Computing Systems – Proceedings	25
Quest	25
Teoriya I Praktika Fizicheskoy Kultury	20

Next, the researchers used the number of scientific publications and the number of citations/citations from the authors as a way to identify the most influential authors in the fields of "evaluation" AND "physical education". More clearly can be seen in Table 2 and Table 3.

Table 2. Most Authors Published Articles in the Field of Evaluation" AND "Physical Education in the Scopus Database"

Authors	Documents	Citations
Lubans, D. R.	7	216
Dos Santos, W.	5	3
Morgan, K.	4	62
Peralta, L. R.	4	81
Alcalá, D. H.	3	31
Bennie, A.	3	51
Cassani, J. M.	3	0
Galmes-Panades, A. M.	3	12
González-Víllora, S.	3	31
Haegele, J. A.	3	39

Table 3. Most Cited Authors in the Field of Evaluation" AND "Physical Education in the Scopus Database

Authors	Documents	Citations
Belland, B. R.	1	319
Kuo, Y.-C.	1	319
Schroder, K. E. E.	1	319
Walker, A. E.	1	319
Lubans, D. R.	7	216
Russ, L.	2	143
Vazou, S.	2	143
Lounsbery, M. A. F.	2	141
Mckenzie, T. L.	2	141
Erwin, H.	1	129

Identifying the number of articles that have been published in the Scopus database and have been cited by other authors/researchers, we are interested in knowing which articles have the most influence on the evaluation aspect in physical education. 188 titles of articles published by Scopus, with the article title l “Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online

education courses" written by Kuo et al. (2014) from the University of Alabama, United States which is the most cited article with a total of 319 citations. More details can be seen in table 3.

Table 4. Most Cited Articles in the Scopus Database on Evaluation" AND "Physical Education

Title	Authors	Citations	Years
Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses	(Kuo et al., 2014)	319	2014
Integrating movement in academic classrooms: Understanding, applying, and advancing the knowledge base	(Webster et al., 2015)	129	2015
Physical education teacher effectiveness in a public health context	(McKenzie & Lounsbery, 2013)	99	2013
Development and evaluation of a training on need-supportive teaching in physical education: Qualitative and quantitative findings	(Aelterman et al., 2013)	83	2013
Measuring teacher effectiveness in physical education	(Rink, 2013)	81	2013
Enhancing the provision of coach education: The recommendations of UK coaching practitioners	(Nelson et al., 2013)	78	2013
What is 'effective' CPD for contemporary physical education teachers? A Deweyan framework	(Armour et al., 2017)	63	2017
Teaching healthful food choices to elementary school students and their parents: The nutrition detectives™ program	(Katz et al., 2011)	62	2011
Outcomes and process evaluation of a programme integrating physical activity into the primary school mathematics curriculum: The EASY Minds pilot randomised controlled trial	(Riley et al., 2015)	57	2015
The predicament of primary physical education: A consequence of 'insufficient' ITT and 'ineffective' CPD?	(Harris et al., 2012)	54	2012

3. What are the keywords that often appear in the field of evaluation in physical education learning in the Scopus database?

This analysis helps us to see the main topics of interest to researchers, to create a conceptual map. Not only that, it can highlight the main trends in research in the field of evaluation and physical education. Co-occurrence of keywords and terms means identifying keywords and terms that are found together in the same paper. This analysis shows the relationship between keywords and terms that appear together in the network map (Van Eck & Waltman, 2010; Zupic & Cater, 2015). Then it focus on the author's keywords and use the VOSviewer software. Of the 188 titles published in the Scopus database, the results of the data visualization analysis using VOSViewer show that the keyword with the highest number of occurrences is physical education (60), evaluation (15), higher education (6), asesesment (5), formative asesessment (7), dan learning (11). A visualization of the item density of high-frequency keywords is presented in Figure 6 and Figure 7.

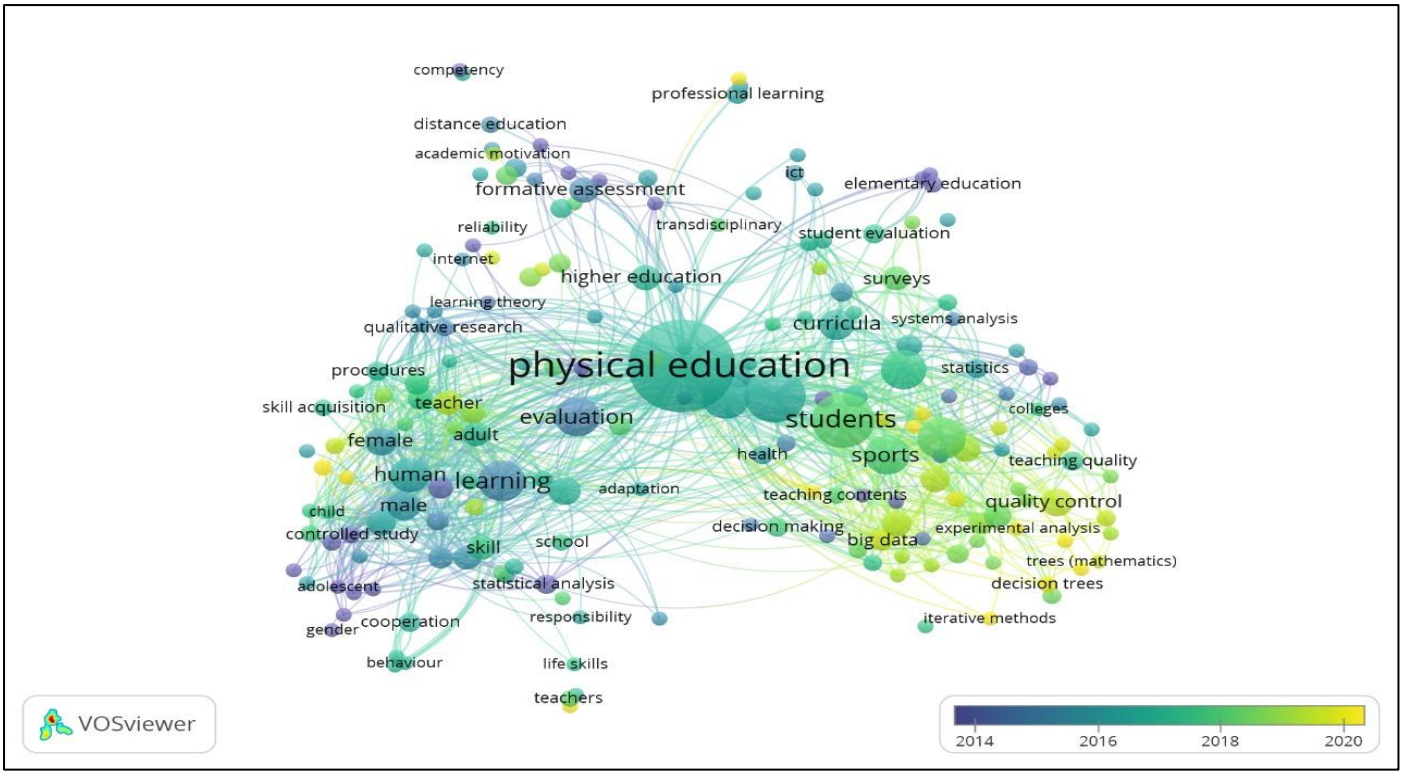

Figure 6. The Most Common Keywords Found in The Field of Evaluation in Physical Education Learning

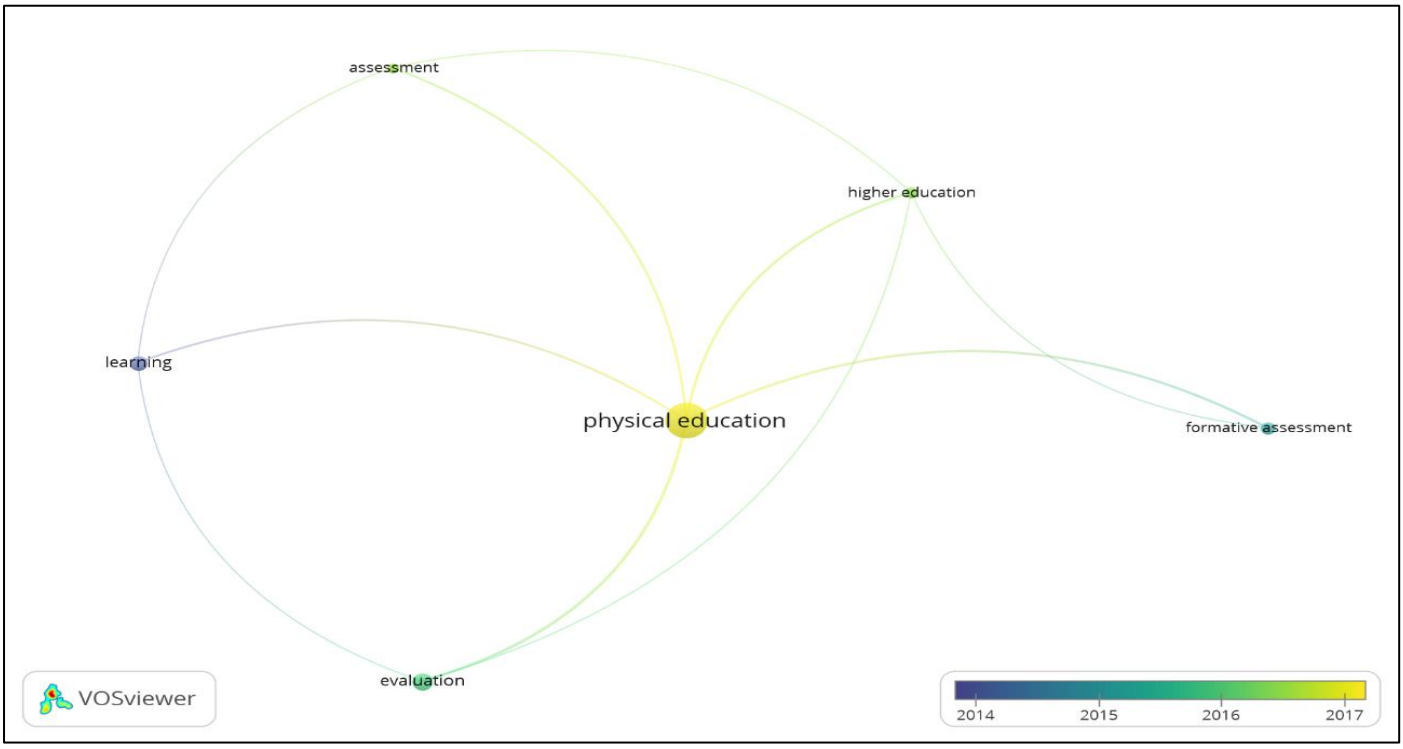

Figure 7. Publication Profile for Evaluation" AND "Physical Education Fields

This study analyzes academic research published in Scopus on the evaluation of physical education learning from 2011-2021. This bibliometric analysis can provide a high-level view of topics of interest to the educational research community, particularly physical education. This in turn provides an understanding of the themes that are less interesting and the level of relevance of these themes. More specifically, the

publication's cluster analysis highlights the different interrelated techniques and application areas that can be used as a guide to identify research gaps.

Based on the results of this bibliometric analysis, a discussion based on research questions is explained. The trend of publications with the topic of evaluating physical education learning has an up and down trend. A significant increase occurred in 2021 with 25 articles, while a drastic decrease occurred in 2020 with 8 articles. This decline may be due to the impact of the COVID-19 pandemic, and the number of researchers in various countries having difficulty conducting research on this topic. The journal that contributed the most was the Journal of Physical Education and Sport with 16 publication articles, and the most influential journal with 265 citations, namely the Internet and Higher Education. The authors who contributed the most to this topic were Lubans, D. R with 7 articles, while Belland, B. R., Kuo, Y.-C., Schroder, K. E. E., and Walker, A. E. were the authors with the most citations (319). The article that has a very large influence written by Kuo et al. (2014) with the title "Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses" has a number of citations (319), and interestingly this is the only article written by Kuo et al. In this study, tested a regression model for student satisfaction involving student characteristics (three types of interaction, internet self-efficacy, and independent learning) and grade level predictors (category of courses and academic programs) (Kuo et al., 2014). Furthermore, the keywords with the highest number of occurrences are physical education (60), evaluation (15), higher education (6), assessment (5), formative assessment (7), and learning (11).

From the emergence of keywords, the topic of assessment evaluation in physical education is an interesting thing to discuss, because assessment is recognized as an important aspect of pedagogical practice and accountability systems, and has a fundamental influence on knowledge and the way of articulating knowledge that is assessed in schools (Thompson & Penney, 2015). However, many teachers complain in conducting the assessment process (Gazali et al., 2022). This is due to the ambiguous mission of assessment, including assessment for learning, and this is a challenge for today's physical education teachers (Tolgfors, 2018). One aspect of 'assessment literacy' is critical involvement in the possible consequences of judgments (Leirhaug et al., 2016; Thompson & Penney, 2015).

CONCLUSION

This study aims to conduct a bibliometric analysis of articles published in the Scopus database on evaluation and physical education. The search results show that the research “evaluation” AND “physical education” AND “learning” Search Results 1 (515 result documents) were started to be published in the Scopus database from 2011-2021. Furthermore, the researchers filtered the types of documents which were only limited to journal articles, so the number of documents found was 188 documents. Based on publications in the Scopus database, the findings reveal that: the number of publications is increasing, although there is an up and down trend from year to year.

The limitation of this research is that the author is only limited to Scopus database information and is also limited to the types of journal article sources, while in the Scopus database there are still types of source documents such as: proceedings, chapter books, editorials, notes, erratums, books, letters, book series. However, the number of articles from the types of documents and sources that the authors limit is very small, and in the author's opinion, will not have a significant effect on this research. This analysis can provide knowledge about research development in aspects of evaluation and physical education and can be a source of data for teachers, lecturers, schools, universities, and the world of education. For future researchers, they can map these points by analyzing the databases of Website of Science and other publishers. Further researchers can also carry out scientometric analysis by combining two databases (Scopus and WoS) using ScientoPy and can continue with mapping until the end of 2022 and can also be a reference by seeing what points are interesting and have not been reviewed by previous researchers.

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CONFLICT OF INTEREST

The Author declared that there are no conflict of interest in writing this article.

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