

A Systematic Review of Learning Media Research Trends From 2011 to 2021

Siti Zahroni¹ 

¹SMP Islam At Taubah, Pulomas, Indonesia



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*Correspondence
Siti Zahroni
sitizahroni@gmail.com

Received:
13 August 2022
Accepted:
12 September 2022
Published:
29 September 2022

Citation: Zahroni, S. (2022). A Systematic Review of Learning Media Research Trends From 2011 to 2021. *Journal of Educational Technology and Instruction*, 1(1), 36-.

Abstract—Several literature review studies analyze trends in using digital learning media in educational process. This goes hand in hand, with the development of ICT in all areas of life. In the literature, learning media by teachers have an important role in the learning and education process. The purpose of this study is to analyze the published literature on learning media through a systematic literature review. A total of 135 articles have been selected for review and analysis from the Springer database published from 2011 to 2021 or the last 10 years. This study analyzes the distribution frequency of publications by year, the number of authors in publication, the top journals with the highest number of articles, and the most productive countries in learning media research. The results of the study show that learning media has become a concern of researchers in the last decade, where considering the annual volume of Learning Media research, the results of the analysis show that the number of articles tends to fluctuate with the peak of publication in 2021, that is 123 articles. The largest percentage in the number of authors was recorded in articles with 3 authors, that is 31.11% or 42 articles. In the analysis of the top 10 publishers, the largest percentage was in articles published by Technology, Knowledge and Learning with 26 articles or 21.13%, then TechTrends, and Educational Technology Research and Development which seemed to be the journals with the most articles published. In addition, if sorted by country, the United States has the highest contribution and followed by Turkey, Taiwan, Spain, Sweden compared to other countries in learning media research around the world.

Keywords: Systematic Literature review, research trends, education, learning media.

1. INTRODUCTION

Education today faces a combination of challenges, including the development of globalization and technological advances. Educational institutions are now being challenged to do more, in order to improve their ability to adapt to changing learning times and add new knowledge. (Cerya et al. 2021). Educators must also be able to respond to these challenges by determining the models, methods, strategies, and learning media used to suit the conditions of students and increase the potential for the success of the learning process. Therefore, education now combines learning content with innovative abilities, as well as information, media, and technology skills.

Learning media are tools, methods, and strategies used to improve communication and interaction between teachers and students and channel messages (teaching materials) to attract the attention, interests, thoughts of students in learning activities as an effort to achieve goals study. (Waller et al. 2019) Through learning media, students can also interact directly with learning resources that contain verbal and nonverbal messages from the teacher and provide opportunities for students to interact directly

with learning resources. Several research results found that learning media had an influence in increasing learning success. (Effendi and Wahidy 2019) Currently, there are many educators who use digital learning materials in the implementation of the teaching and learning process, one of which is textbooks, which are starting to be abandoned in favour of digital products such as electronic books (e-books).

Therefore, a literature review study that discusses learning media in education is important to do. The results of this study are expected to be useful as a reference for educators and researchers in obtaining information about research trends and possible directions for learning media research, especially between 2011 and 2021. For this purpose, a total of 135 journal articles published by Springer were identified. As we know, Springer is a global publisher that publishes millions of scientific documents in various disciplines, including education. The research questions raised in this systematic literature review are:

1. How is the distribution of annual publications in the field of Learning Media during 2011-2021?
2. How is the distribution of reviewed articles based on the number of authors for the period 2011-2021?
3. Which academic journals publish more papers related to Learning Media in the 2011-2021 period?
4. Which countries contributed the most or were productive to research publications in various academic journals from 2011-2021?

2. METHODS

2.1 Research Design

The author conducted a comprehensive search for all articles related to Learning Media from the integrated Springer Link database for 48 articles of good quality from leading journals published by springer publishers <https://link.springer.com/> during 2011-2021 on 28 October 2021.

2.2 Inclusion Criteria

Authors set specific criteria for submitting articles. As a note, this analysis focuses on references in the form of research articles.

2.3 Data Analysis

The keyword used to get the article is the topic of Learning Media. The author focuses on these keywords because they are topics of research that will be raised, but more specifically on discussions related to learning media with the development of electronic modules in chemistry learning in stoichiometry material using guided discovery learning strategies. Based on an initial search related to Learning Media, 311,056 articles were obtained, then 23,464 articles for educational disciplines and 3,945 for selected chemistry disciplines were in English during 2011-2021. Then, from this, the learning and instruction sub-discipline was selected which contained 5,543 articles, 5,102 general educational articles, 4,641 science education articles, and 4,353 educational technology articles.

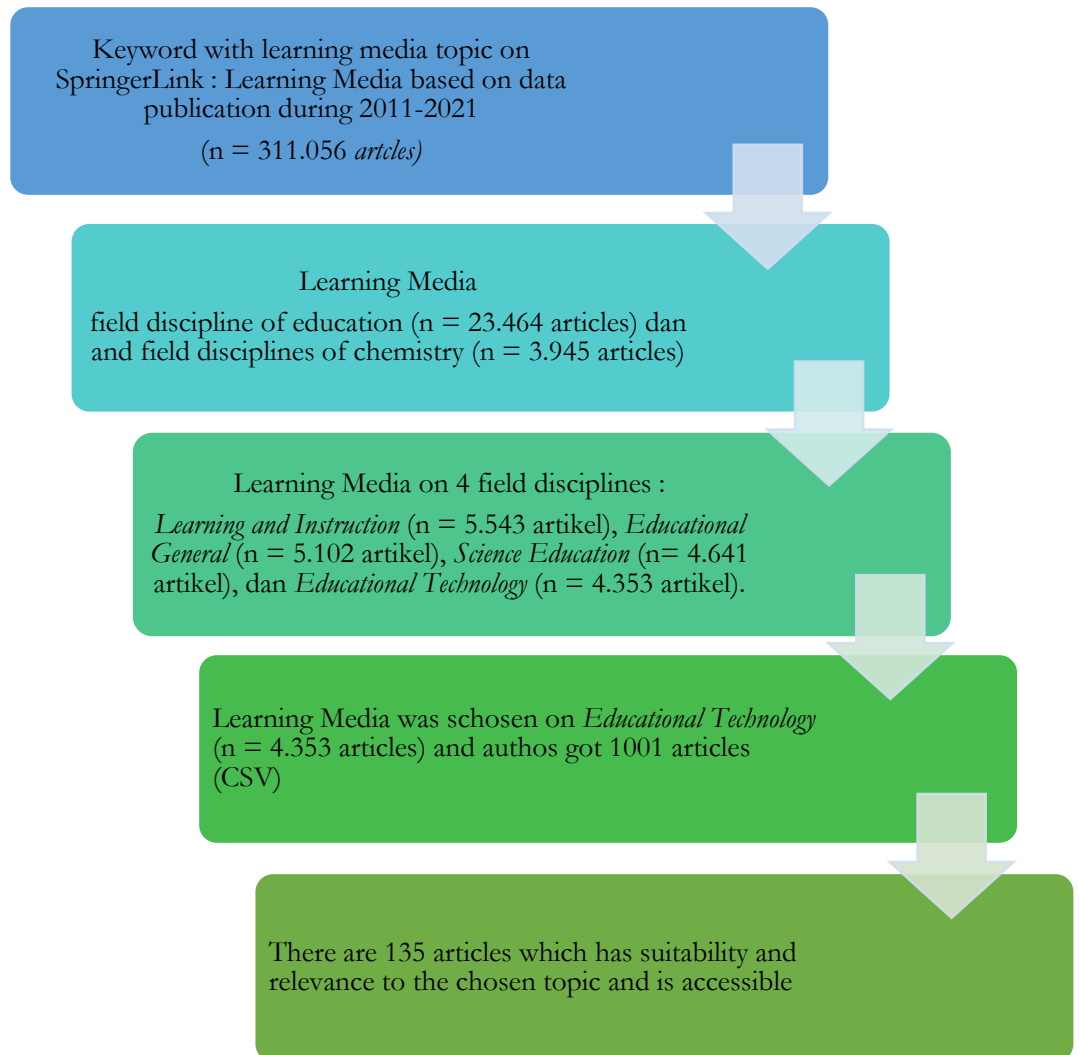


Figure 1. Research Procedure

In ensuring that the papers obtained are relevant or not, the authors identify the title of the article (item title), publication title (publication title), publication year (publication year), and the author's name (authors) in order to obtain 135 appropriate articles and eliminate 866 articles that do not fit the topic to be analyzed.

The variables that will be used in the analysis of this literature review include:

- 1) Distribution of publications by year
- 2) Number of authors in publication
- 3) The top journal with the greatest number of articles
- 4) The most productive countries in research

3. RESULTS

The results include Distribution of publications by year, number of journal publications that are the most widely used, top journal with the greatest number of papers, most productive country, number of authors in publication.

3.1 Distribution of Learning Media Research Publications by Year

To answer the first analysis variable, which is related to the distribution of publications, Figure 1. Figure 1 shows the growth of the publication of Learning Media research articles in the period 2011 to 2021.

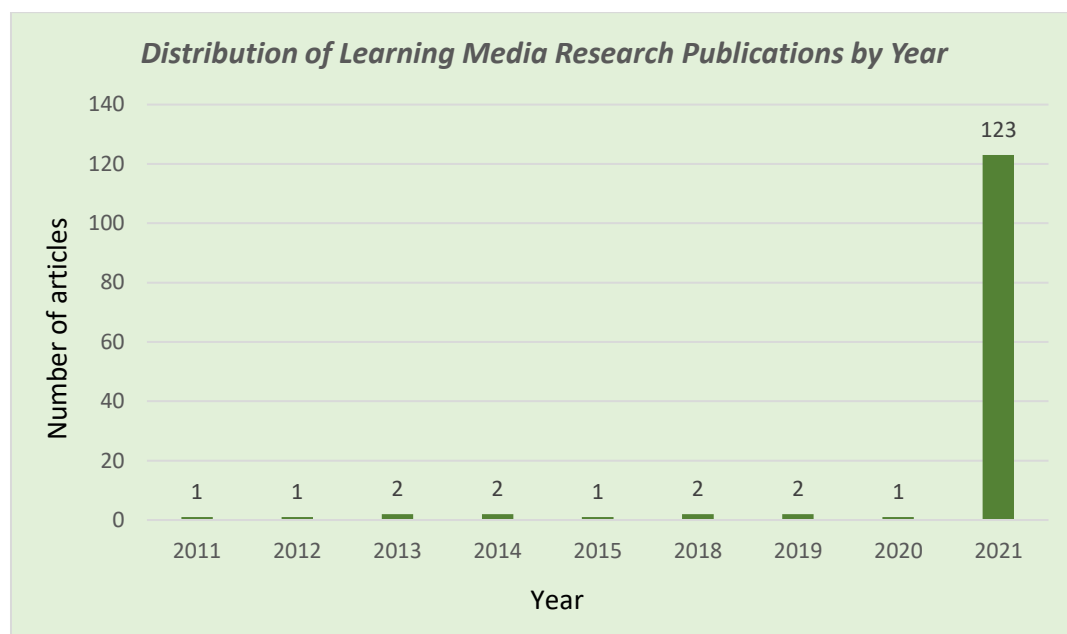


Figure 2. Number of Published Papers Relating to Learning Media

The results of the analysis show fluctuations. The peak of publication in research occurs in 2021, which is 123 articles out of a total of 135 articles. Whereas in previous years there were fewer, namely only 1-2 articles from 2011 to 2020. The author estimates that this situation will occur because over time, especially in 2021, the topic of Learning Media research has attracted the attention of researchers from all over the world given the current state of learning, must be faced during a pandemic where teachers or educators are more creative in developing learning media for students at schools or campuses so that learning remains interesting and innovative. In addition, the large need for digital-based learning resources that integrate learning material content into technological media that is easily accessible to interactive for students, educators, and researchers is also the reason for the increased publication of articles on the topic of Learning Media research.

3.2 Number of Authors in Learning Media Research Publications

To answer the second analysis variable related to the number of authors, it is shown in tables 2 and 3. Tables 2 and 3 present information about the number of authors in the publication of learning media articles from 2011 to 2021.

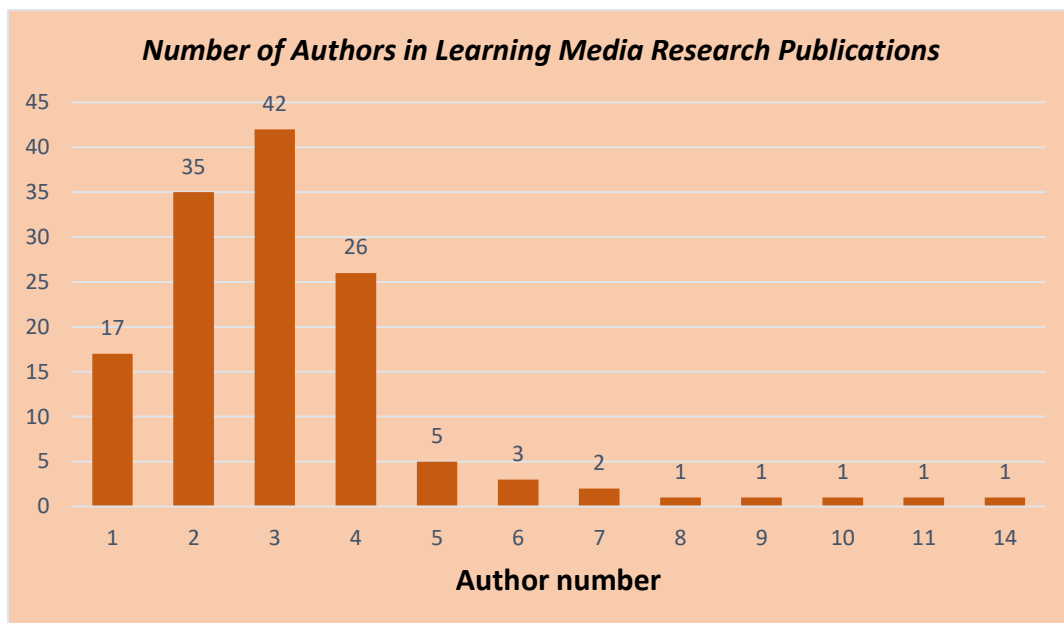


Figure 3. Number of Authors on Published Papers Relating to Learning Media in the Literature

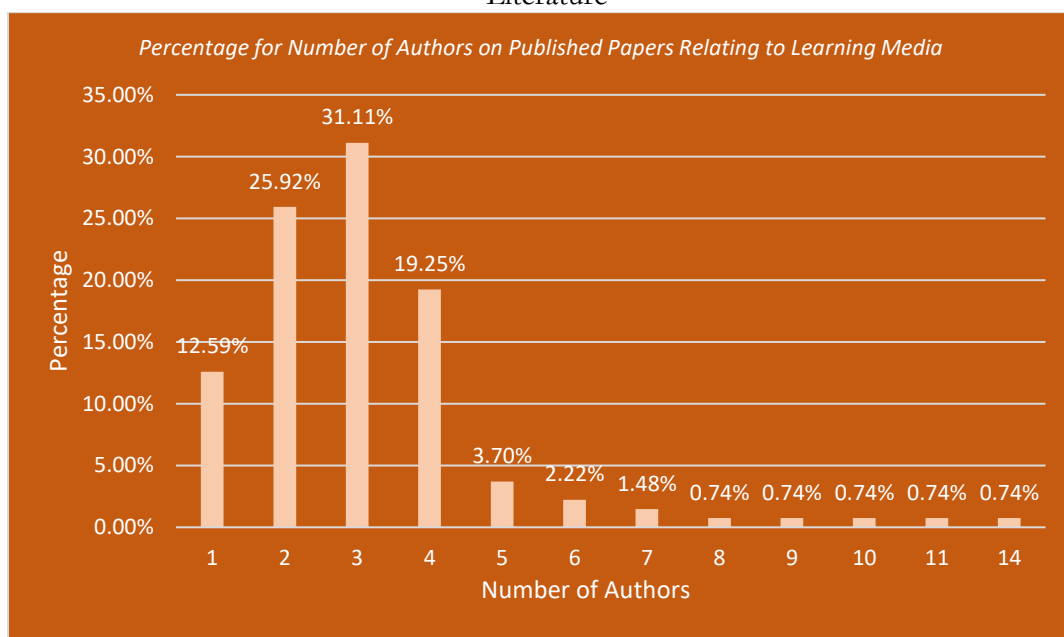


Figure 4. Percentage for Number of Authors on Published Papers Relating to Learning Media

If analyzed from authors in publications where there are 135 articles, the largest percentage is in articles with 3 authors, namely 31.11% or there are 42 articles then from 2 authors, namely 25.92% or there are 35 articles, then from 4 authors, namely 19.25 % or 26 articles, and from 1 author that is 12.59% or 17 articles. The rest are 3.70% or 5 authors, 2.22% from 6 authors, 1.48% from 7 authors, and 0.74% for 8,9,10,11,14 authors. This situation is caused by quite several writers who choose to collaborate in developing research and compiling articles in Learning Media research.

3.3 Top Journals with the Most Articles of Learning Media Research

To answer the second analysis variable related to the number of authors, it is shown in Tables 4 and 5. Tables 4 and 5 present information about the number of authors in the publication of learning media articles from 2011 to 2021.

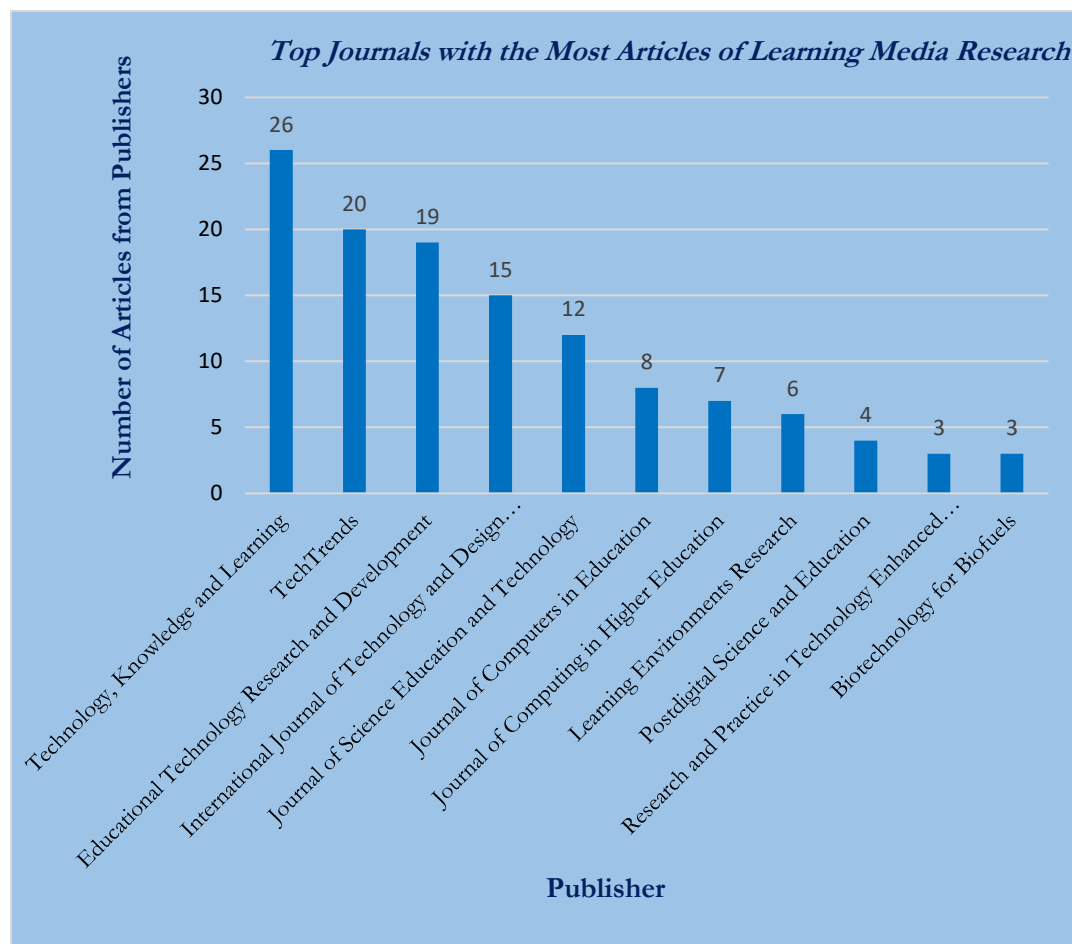


Figure 5. Number of Papers from Publisher Relating to Learning Media

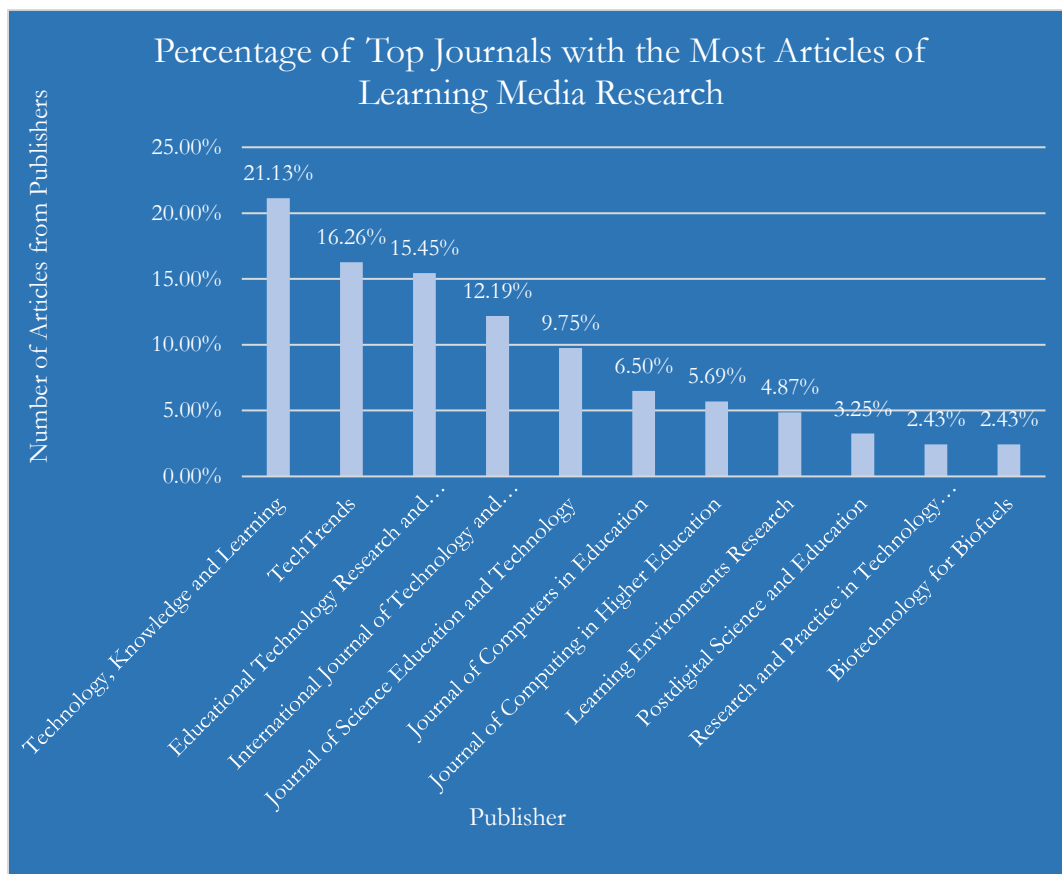


Figure 6. Percentage for Number of Papers from Publisher Relating to Learning Media

If analyzed from the top 10 publishers (Top 10) with 123 articles, the largest percentage is in the articles published by Technology, Knowledge and Learning as many as 26 articles or 21.13%, then TechTrends as many as 20 articles or 16.26%, then Educational Technology Research and Development as many as 19 articles or 15.45%, International Journal of Technology and Design Education as many as 15 articles or 12.19%, Journal of Science Education and Technology as many as 12 articles or 9.75%, Journal of Computers in Education as many as 8 articles or 6.50%, Journal of Computing in Higher Education as many as 7 articles or 5.69%, Learning Environments Research as many as 6 articles or 4.87%, Post digital Science and Education as many as 4 articles or 3.25%, Research and Practice in Technology Enhanced Learning as many as 3 articles or 2.43%, and Biotechnology for Biofuels as many as 3 articles or 2.43%. This is because, the publisher or publisher is an indexed or registered publisher, so that it also supports the publication of researchers related to Learning Media research.

3.4 Most Productive Countries in Learning Media Research

To answer the second analysis variable related to the number of authors, tables 6 and 7 are shown, which aims to find out the most productive countries in the world in learning media and identify the most productive countries in the field of Learning Media. Tables 6 and 7 present the countries (15 different countries) in the top 10 rankings (Top 10) that contribute to publication along with the number of Learning Media articles worldwide during 2011 to 2021.

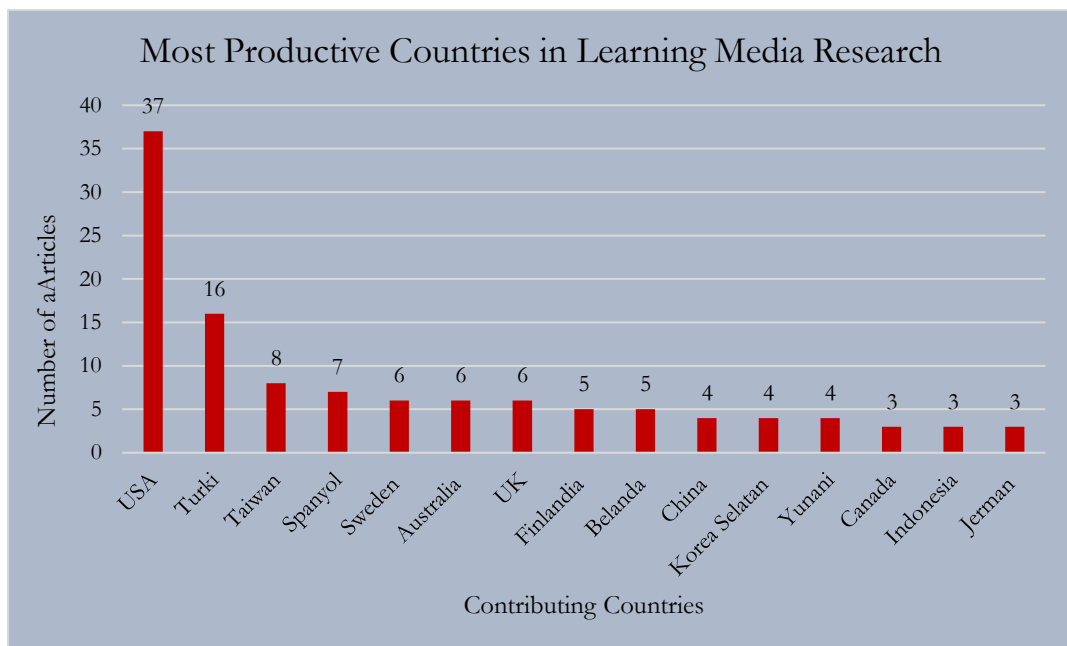


Figure 7. Number of the most Countries that Contribute to Learning Media Research

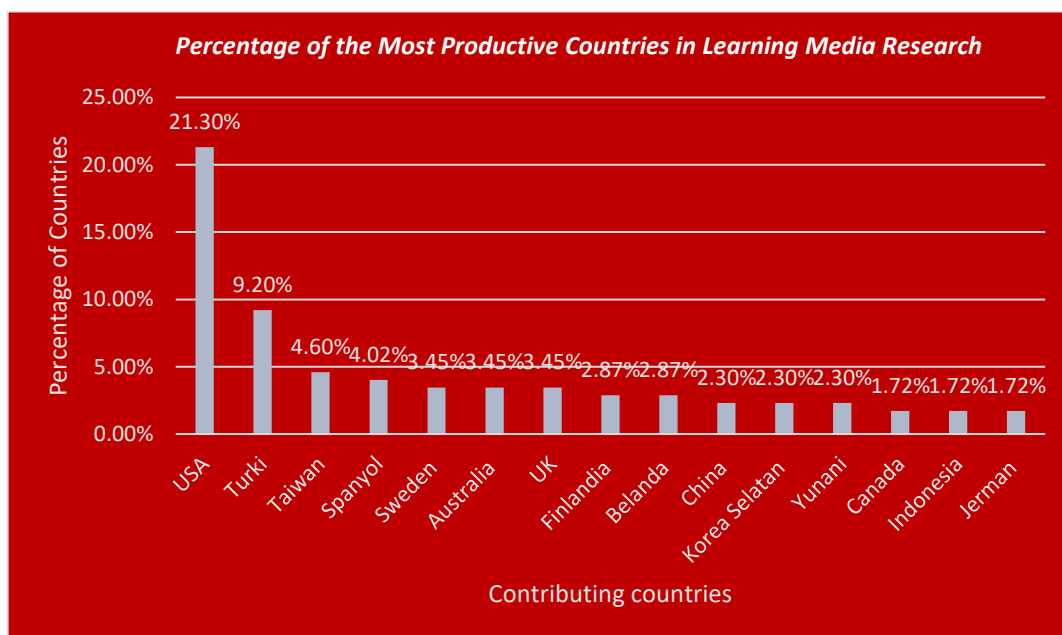


Figure 8. Percentage for the Most Countries that Contribute to Learning Media Research

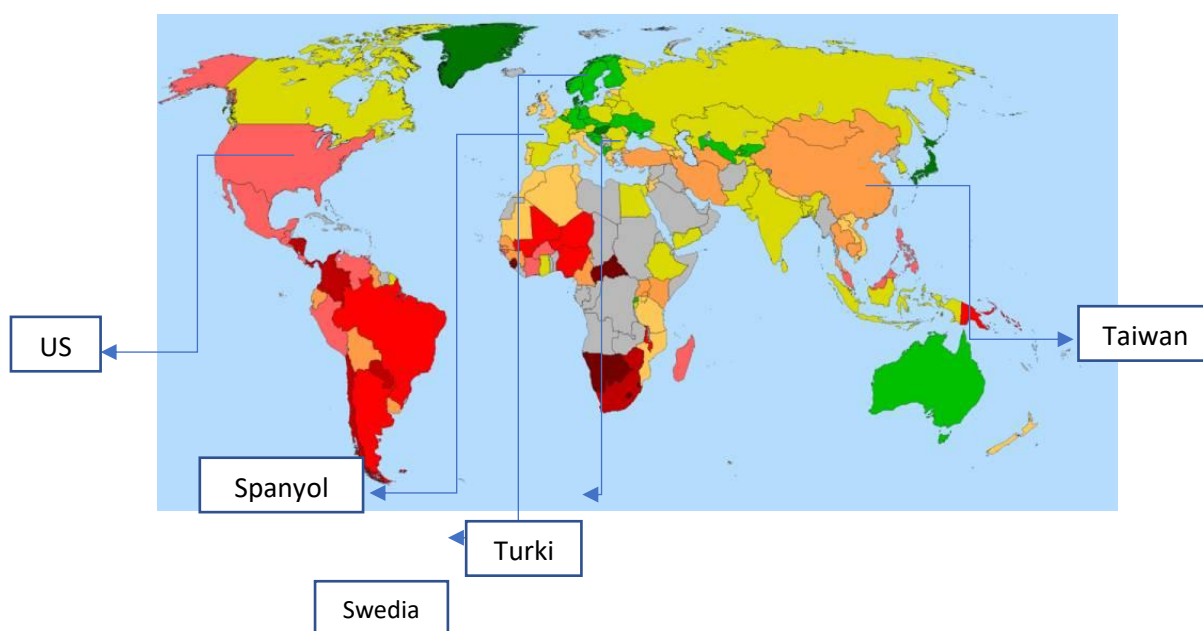


Figure 9. The Map of Top 5 Countries That Contribute To Learning Media Research

In this review, the number of articles analyzed was 135 articles. However, the author took the top 10 rankings (Top 10) countries that contributed the most to Learning Media articles, where based on the analysis the United States (US) became the first most contributory where there were 37 articles or 21.30%, then Turkey is in second place where there are 16 articles or 9.20%, then Taiwan has 8 articles or 4.60%, and other countries such as Spain as many as 7 articles or 4.02%, Sweden and Australia England (UK) as many as 6 articles or 3.45%, Finland and the Netherlands as many as 5 articles or 2.87%, China, South Korea, Greece as many as 4 articles or 2.30%, and Canada, Indonesia, and Germany as many as 3 articles or 1.72% . The author finds that the reason is that the provision of funds for research in this field in these countries is quite large compared to other countries which of course cannot be separated from the benefits of research in this field for the benefit of the quality of education nationally.

4. DISCUSSION

The articles selected for this literature review were published in the range from 2011 to 2021 or the last 10 years so that they are in accordance with the current situation and are worthy of being used as references by researchers and educators in the topic of learning media. The highest number of reviews is in 2021 compared to other years. All articles selected in this case are of high quality because they are indexed and accessible via Springer. From the results obtained, there are quite a number of countries that implement the development of learning media or learning media processes in education. Based on the data collection method, the researcher chose a qualitative research approach.

Most of the studies on the development of learning media use a qualitative research approach. The choice of content analysis is supported by several previous studies examining year of publication and type of publication. In this case, readers can judge whether the articles analyzed are of quality, up-to-date, and consider other important factors. However, related to the stages of developing learning media in education, it will be explained in further research.

5. CONCLUSION

This paper systematically reviews and analyzes the literature related to the topic of learning media and identifies several things that are considered to have an influence on research trends in this research field. More specifically, this paper also provides insight into variables such as distribution of publications by year, number of authors in publication, top journals with the greatest number of articles, and most productive countries in learning media research. This is because, the rapid development of technology in fact needs to be accompanied by the abilities and skills of educators in knowing the direction of developing the application of learning media as a trigger for students' curiosity and interest in the learning process so that learning objectives can be achieved and learning outcomes increase. Existing learning media also continue to develop along with technological advances such as the use of digital white boards, digital comics, electronic books, electronic modules, educative flash cards, to gamification containing learning material content according to the field studied. By understanding this review, it is hoped that it will contribute to teachers and researchers in designing meaningful teaching and learning activities and better constructing students' knowledge to get more effective and interesting learning.

6. LIMITATIONS AND RECOMMENDATIONS

Systematics literature review provides an evaluation of the previous literature and some suggestions for researchers and educators in current until future studies of learning media in education. There are limitations that must be considered. First, the research is limited from Springer database and its articles. Second, the research is limited in time span. And third, the research is limited to learning media in education topic.

Based on these limitations, the researchers suggest using more articles with the longer term, more databases, and educational topics to be used in the further study. It is to provide more detailed information about learning media research trends.

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Author Biography

Siti ZAHRONI	SMP Islam At Taubah, Pulomas, Indonesia E-mail: sitizahroni@gmail.com ORCID: https://orcid.org/0000-0002-7413-1738
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