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## The Use of Mobile Learning in Schools as A Learning Media: Bibliometric Analysis

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### ABSTRACT

This bibliometric research aims to evaluate previous academic work that has been carried out in the context of the use of mobile learning at school. Research method using bibliometric analysis from the Scopus Database. From the results of the analysis that has been carried out, it can be concluded that the two decades of analysis show significant growth in Mobile Learning studies, with 209 documents published by 98 sources and active participation from 602 authors, highlighting the synergy between individual and collaborative efforts in research that has a global reach. A special focus in 2020 illustrates the vital role of mobile learning in addressing educational challenges during the pandemic. The dominant contribution from Taiwan, especially through the National Taiwan University of Science and Technology and lead researcher Gwo-Jen Hwang, confirms the country's position as a leader in Mobile Learning research. Meanwhile, the journal "Computers and Education" emerged as the main source of literature. Topics such as motivation, augmented reality, mobile applications, mobile phones, surveys, and technology acceptance models show potential that has not yet been fully explored, promising innovations in mobile learning applications in schools.

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## 1. INTRODUCTION

In the 21st century, technology is developing very quickly, bringing significant changes in Human Resources and infrastructure (Zetriuslita *et al.*, 2020a, Zetriuslita *et al.*, 2020b). This evolution also extends to the education sector, which is now experiencing major improvements in quality. Realizing the importance of education in the progress of a nation, countries around the world are working hard to improve it. As a result, education has become an important pillar in national growth strategies and community development (Yunus *et al.*, 2022; Wahyuni *et al.*, 2020).

Education is a conscious and planned effort that aims to realize and develop individual potential, as well as a profound environmental influence on the individuals themselves, producing sustainable changes in their habits, ways of thinking, and feelings (Amin, 2018). Education is an essential spearhead in improving the quality of human resources and is also the main factor in shaping individual personalities so that they have more focused and defined traits and goals (Sudarmono *et al.*, 2020; Zafrullah *et al.*, 2023a; Zafrullah *et al.*, 2023 b). So, it can be concluded that education is a fundamental process that not only develops individual potential through conscious and structured efforts but also actively shapes personality and influences habits, thoughts, and emotions, playing a crucial role in improving the quality of human resources and guiding a person's direction and personal goals.

One important factor in making education good is the use of learning media. Learning media are tools that play a role in concretizing concepts or ideas and function to motivate students so that the material presented becomes easier to understand and interesting for them (Aghni, 2018; Karo-Karo & Rohani, 2018). Learning media can be defined as anything used in learning activities, which is physical or technical, and functions as a means of transmitting effective learning messages and information (Anshori, 2018; Rahmi & Samsudi, 2020). Learning media is not only an important element that must be fulfilled in the teaching and learning process, but also plays a crucial role because its presence can help teachers convey material, increase understanding, and motivating students (Mahmudah, 2018; Susilo, 2020).

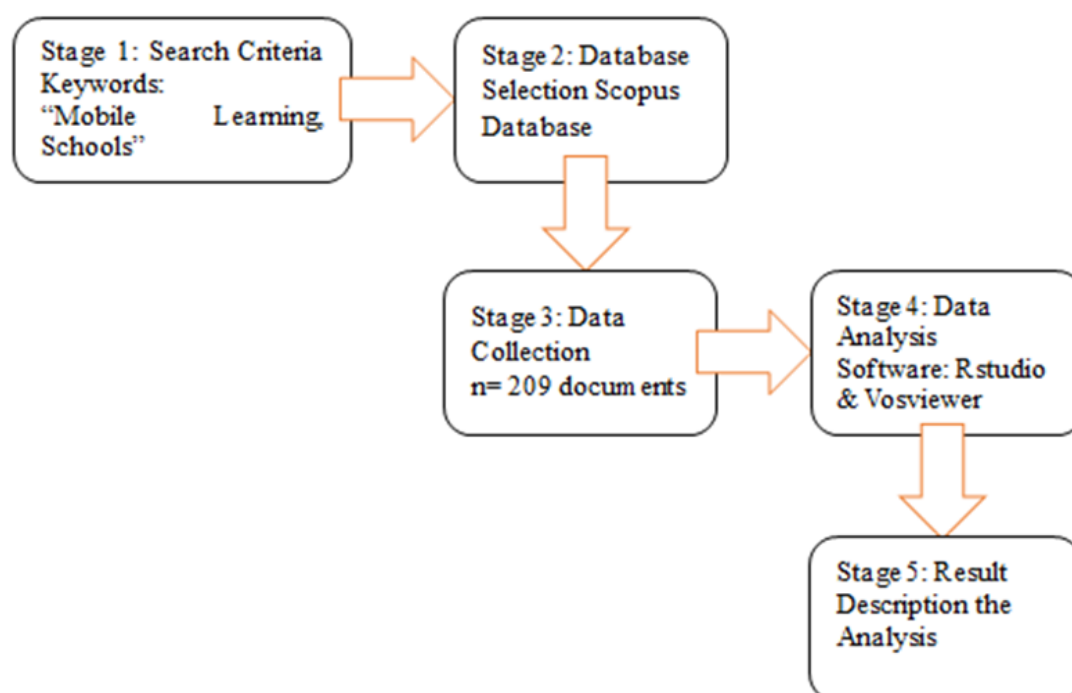
One of the learning media that is widely used is mobile-based learning or in short Mobile Learning. Mobile learning is a learning method that utilizes wireless technology, such as smartphones, to provide educational content and materials, enabling flexible and dynamic access to learning resources anywhere and anytime (Samsinar, 2021; Zuniari *et al.*, 2022). Mobile learning is a form of learning that uses portable electronic devices to facilitate access to information, and its existence helps students to repeat lesson material according to their needs with significant ease (Arfianti *et al.*, 2023; A. Rahmi *et al.*, 2023). Mobile learning is an appropriate means of obtaining learning resources, so its existence occupies an important position in the classroom context to support the educational process (Ariyanto *et al.*, 2020; Juniarti & Gustiana, 2019).

The rapid development of mobile learning in the school environment has triggered a wave of diverse research, attracting the attention of researchers to look deeper through bibliometric analysis. This research explores various scientific works in the field of mobile learning, where the author aims to identify and analyze publication trends that have occurred over time. In addition, innovation in the use of keywords is also a focus, given its importance in describing the evolution and focus of research. This analysis aims to map and understand in-depth insights regarding the development of mobile learning, which will contribute to our understanding of the future direction of education in schools. This will allow authors to

identify publication trends and direct future research into unexplored areas by identifying the latest keywords. Finally, the results of this analysis are expected to provide clear direction regarding the new horizon that school education will face in integrating mobile learning technology.

## 2. METHODS

The bibliometric method aims to review existing academic literature regarding the application of Mobile Learning in the school education environment (see **Figure 1**). This bibliometric approach is used to understand developments in this field by examining scientific works from social, intellectual, and conceptual perspectives (Supinah & Soebagyo, 2022). This method is often applied in various scientific disciplines to carry out quantitative analysis of scientific publications such as journals, books, and other forms of written communication. The entire data analysis and mapping process was carried out using R-Studio, which is a recognized bibliometric tool (Saifudin, 2013).



**Figure 1.** Schematic diagram of the physicochemical treatment process in the station of the textile industrial unit.

In the initial stages of this research, we focused on collecting scientific sources that are closely related to the use of Mobile Learning in the school environment, by selecting relevant keywords to ensure the relevance of the literature and keep the research focused without deviating from the main topic. We used a search strategy that included synonyms and two key elements: the first was developments in information and communication technology through the term "Mobile Learning", and the second was the context of the use of this technology in "Schools". Next, the search process was carried out in the Scopus database, which is widely recognized and respected in academic circles as a credible source of scientific information. After searching with specified keywords, we succeeded in identifying 209 documents that were ready for further analysis.

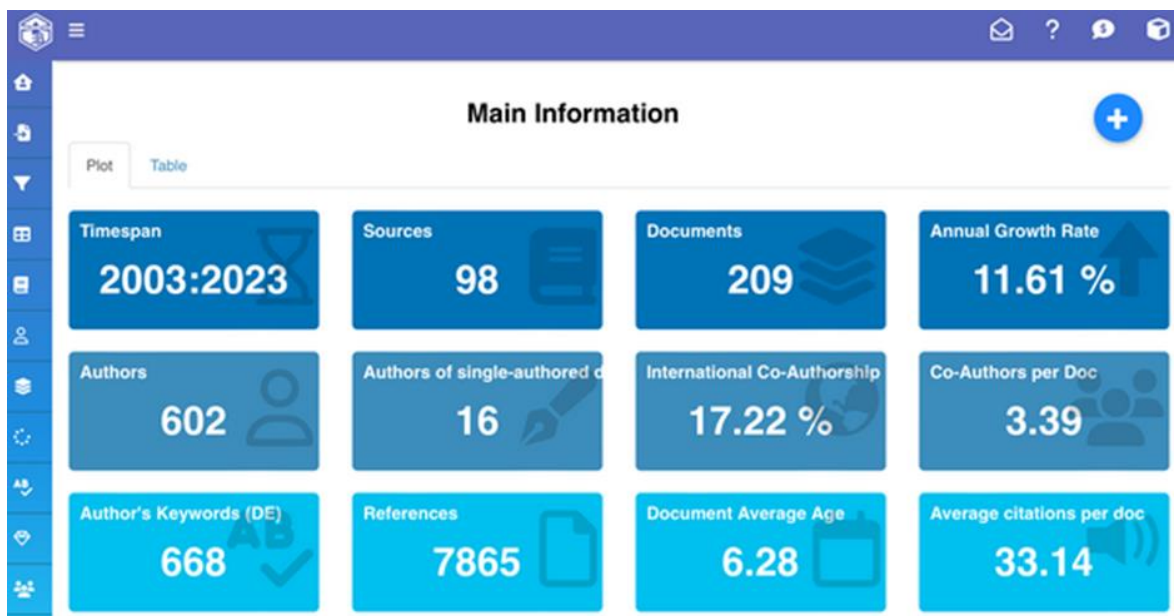
After collecting data, the next stage is to evaluate the selected documents using established methods, namely through the R package Bibliometrix, an open-source software

with powerful bibliometric capabilities, developed in R by Aria and Cuccurullo (Amin *et al.*, 2023). With algorithms for mathematics, statistics, and scientific mapping, as well as the Biblioshiny web interface, which makes bibliometric analysis easy for users without a programming background, data from Scopus is imported in CSV format. Vosviewer is also used for research novelty mapping. After data processing and analysis, the final stage is the presentation of results, conclusions, and quantitative evaluation of the research that has been analyzed, including a detailed explanation of the findings and a visual representation of the data.

### 3. RESULTS AND DISCUSSION

#### 3.1. Results in Main Information

Once the relevant data has been transferred to the Biblioshiny platform, the software displays an initial screen containing basic information about all the articles that have been uploaded and are ready for analytical processing. Key information regarding documents to be analyzed using bibliometric techniques is available in the display shown in **Figure 2**.



**Figure 2.** Main information analysis of mobile learning research in schools.

**Figure 2** summarizes research activity over the twenty-year period from 2003 to 2023. During this time, 98 sources have contributed to the publication of 209 documents, indicating a healthy annual growth rate of 11.61% in the field of study. This dynamic growth rate signals increasing interest and continued expansion in the area of study. A total of 602 authors were involved, with 16 authors having self-written documents, highlighting the level of individual contribution amidst a collaborative field. The international author collaboration rate stands at 17.22%, indicating a moderate level of global collaboration among researchers. In this study, the author used 668 keywords. An impressive number of references of 7865 have been cited, indicating the broad foundation on which the field is built. The average number of authors per document was 3.39, reflecting a collaborative research approach. The average number of citations per document was 33.14, which is a strong indicator of the impact and relevance of research output in this area, as higher citation rates often correlate with the significance of the work within the academic community and beyond.

### 3.2. Publication Trends

There are publication trends related to research on Mobile Learning at school (**Table 1**). The data displayed in the table depicts the number of articles related to Mobile Learning in schools published from 2003 to 2023. There is a consistent upward trend in the number of articles over time, with some fluctuations occurring. 2020 marked a peak in the number of articles with 23 publications, representing 11% of the total, likely due to the push for distance education during the COVID-19 pandemic. Overall, this indicates increasing interest and research in the use of mobile technology for learning in school settings, reflecting technological developments and adaptation to new teaching methods. Annual fluctuations may reflect various factors, such as changes in educational policy, technological innovations, or responses to changing global educational needs.

**Table 1.** Number of publications each year .

Year	Articles	Percentage
2003	1	0.48%
2004	1	0.48%
2005	1	0.48%
2006	-	-
2007	1	0.48%
2008	3	1.44%
2009	4	1.91%
2010	7	3.35%
2011	11	5.26%
2012	10	4.78%
2013	9	4.31%
2014	12	5.74%
2015	13	6.22%
2016	18	8.61%
2017	15	7.18%
2018	16	7.66%
2019	22	10.53%
2020	23	11.00%
2021	17	8.13%
2022	16	7.66%
2023	9	4.31%
<b>Total</b>	<b>209</b>	<b>100%</b>

### 3.3. Affiliates with Highest Publications

The ten affiliates with the highest publications are attached in **Table 2**. The data displayed in the table refers to the contribution of various educational institutions to research in the field of mobile learning in schools. National Taiwan University of Science and Technology leads the way with 20 articles, demonstrating significant focus and leadership in research in Taiwan. Other universities in Taiwan, such as the National University of Tainan and National Cheng Kung University, also show strong contributions with 12 and 9 articles respectively. Vietnam is represented by Ho Chi Minh City University of Education with 9 articles, while Australia has two institutions, the University of Technology Sydney and Monash University, with 9 and 8 articles respectively. Nigeria and Indonesia, with the University of Ibadan and the Graduate School of Yogyakarta State University respectively, as well as Taiwan's Capital Normal University, also contributed to the research corpus. The presence of institutions from these different countries indicates geographic diversity and international collaboration in research and highlights the importance of this topic in many educational contexts.

**Table 2.** Affiliates with the highest publications.

Affiliation	Country	Articles
National Taiwan University of Science and Technology	Taiwan	20
National University of Tainan	Taiwan	12
Ho Chi Minh City University of Education	Vietnam	9
National Cheng Kung University	Taiwan	9
University of Technology Sydney	Australia	9
Monash University	Australia	8
National Central University	Taiwan	8
University of Ibadan	Nigeria	8
Graduate School of Yogyakarta State University	Indonesia	7
Capital Normal University	Taiwan	6

### 3.4. Most Productive Source

Citation analysis starts with the ten main sources that have the largest number of publications on Mobile Learning in schools listed in the Scopus index which is presented in **Table 3**.

**Table 3.** The most productive sources.

Journal	h_index	TC	NP
Computers and Education	15	1762	16
International Journal of Mobile Learning and Organisation	10	340	17
British Journal of Educational Technology	9	610	9
Interactive Learning Environments	6	161	8
International Journal of Mobile and Blended Learning	6	94	9
Journal of Computer Assisted Learning	6	728	6
Educational Technology and Society	5	964	5
Education and Information Technologies	4	70	6
International Journal of Instruction	4	71	4
Sustainability (Switzerland)	4	67	4

Description: TC=Total of Citations, NP=Number of Publications

In the context of mobile learning in schools, "Computers and Education" stands out as the journal with the greatest influence, demonstrated by the highest h-index of 15 and a very high number of citations of 1762, which indicates the relevance and usefulness of the research it publishes for educational researchers and practitioners. Meanwhile, the "International Journal of Mobile Learning and Organization" shows its strength in the mobile learning community with an h-index of 10 and 340 citations, confirming that this journal is not only productive with 17 publications but also has articles with wide impact. This publication together with the "British Journal of Educational Technology" and the "Journal of Computer Assisted Learning" contributes to a deep understanding of the importance of mobile technology in education, supporting more flexible and accessible learning in the school environment.

### 3.5. Most Published Authors

The following ten authors with the most publications on Scopus are attached in **Table 4**.

**Table 4.** Top 10 authors with the highest scopus publications.

Name	Affiliation	Country	NP	TC
Great-Jen Hwang	National Taiwan University of Science and Technology	Taiwan	19	1949
Yueh Min Huang	National Cheng Kung University	Taiwan	6	206
Chiu-Lin Lai	National Taipei University of Education	Taiwan	5	371
Chin-Chung Tsai	National Taiwan Normal University	Taiwan	5	580
Hui-Chun Chu	Soochow University	Taiwan	4	702
Matthew Kearney	University of Technology Sydney	Australia	4	240
Chee-Kit Looi	Education University of Hong Kong	Hong Kong	4	142
Sandy Schuck	University of Technology Sydney	Australia	4	240
Po-Sheng Chiu	National Chiayi University	Taiwan	3	44
Helen Crompton	Old Dominion University	United States	3	221

Note: TC=Total of Citations, NP=Number of Publications

Gwo-Jen Hwang of the National Taiwan University of Science and Technology stands out as a leading researcher in Mobile Learning with 19 publications and 1949 citations, marking Taiwan as a key contributor to the field and confirming its position as an important research center. This is supported by contributions from other Taiwanese researchers such as Yueh Min Huang and Chiu-Lin, Lai. Contributions from international researchers such as Matthew Kearney from Australia and Helen Crompton from the United States demonstrate that Mobile Learning is an important global educational issue, with a high number of publications and citations reflecting their significance and influence. The productivity and impact of these works provide a clear picture of the importance of Mobile Learning in schools around the world and the direction of future trends and research, with the work of these researchers as a key reference in understanding the evolution of this area in education.

### 3.6. Highest Citation Publications

**Table 5** presents the ten most cited articles obtained from various sources and authors. The table below reveals the results of a bibliometric analysis highlighting the articles that have received the highest number of citations.

[Chiang et al. \(2014\)](#) led the way with 357 citations for their research on augmented reality-based mobile learning systems, indicating the growing interest in the integration of advanced technologies in education. Closely followed by [Chu et al. \(2010\)](#) with a two-tiered approach in the development of location-aware mobile learning, received 351 citations and highlighted successful applications of mobile technology that took geographic aspects into account. Articles by [El-Hussein & Cronje \(2010\)](#), who define mobile learning in the context of higher education, and [Chen et al. \(2003\)](#), receiving 348 and 347 citations respectively, demonstrate the importance of a deep understanding of how mobile learning can be adapted to specific educational needs. Additionally, research by [Hwang et al. \(2011\)](#) and [Hsu et al. \(2013\)](#), both of whom encourage the use of interactive concept maps and personalized recommendations in mobile learning, emphasizes the importance of approaches that support student engagement and self-directed learning. The lack of citations, as pointed out by [Zurita & Nussbaum \(2004\)](#), does not diminish the value of their contribution to constructivist approaches in mobile learning, while [Crompton et al. \(2017\)](#) received high recognition for

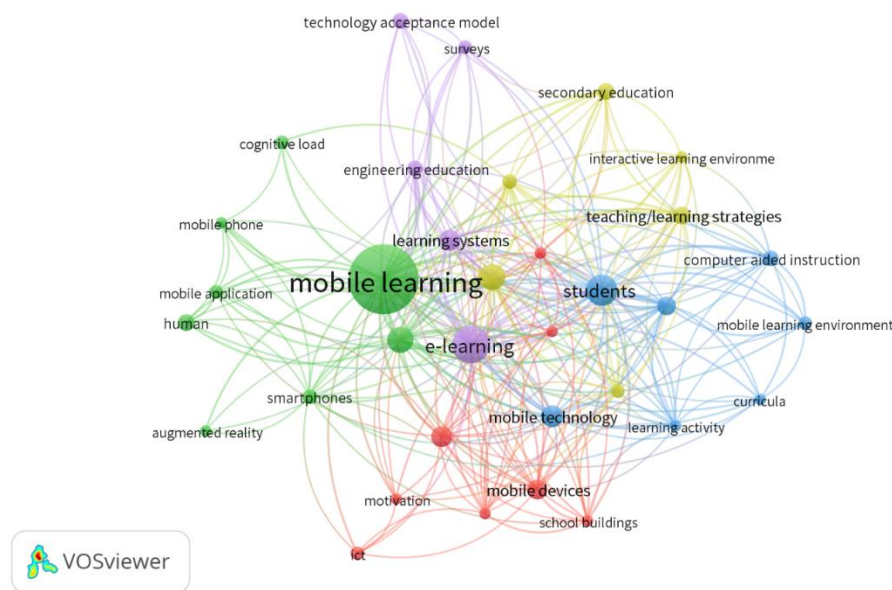
their systematic research on the use of mobile learning in PK-12 education with 169 citations. These overall trends signal the rapid growth and far-reaching impact of mobile learning in modernizing and improving educational processes around the world.

**Table 5.** Top 10 documents with the highest citations.

Author	Title	Total Citations	TC/Year	Normalized TC
(Chiang <i>et al.</i> , 2014)	An augmented reality-based mobile learning system...	357	35.70	5.45
(Chu <i>et al.</i> , 2010)	A two-tier test approach to developing location-aware mobile learning...	351	25.07	3.19
(El-Husseini & Cronje, 2010)	Defining mobile learning in the higher education landscape	348	24.86	3.16
(Chen <i>et al.</i> , 2003)	A mobile learning system for scaffolding bird watching learning	347	16.52	1.00
(Wang <i>et al.</i> , 2009)	The impact of mobile learning on students' learning.	263	17.53	3.06
(Hwang <i>et al.</i> , 2011)	An interactive concept map approach to supporting mobile learning...	220	16.92	3.99
(Hsu <i>et al.</i> , 2013)	A personalized recommendation-based mobile learning...	215	19.55	3.39
(Yin <i>et al.</i> , 2013)	Learning by searching: A learning environment that provides...	176	16	2.78
(Zurita & Nussbaum, 2004)	A constructivist mobile learning environment...	174	8.7	1
(Crompton <i>et al.</i> , 2017)	The use of mobile learning in PK-12 education: A systematic review	169	24.14	7.18

### 3.7. Research Focus and Keyword Novelty

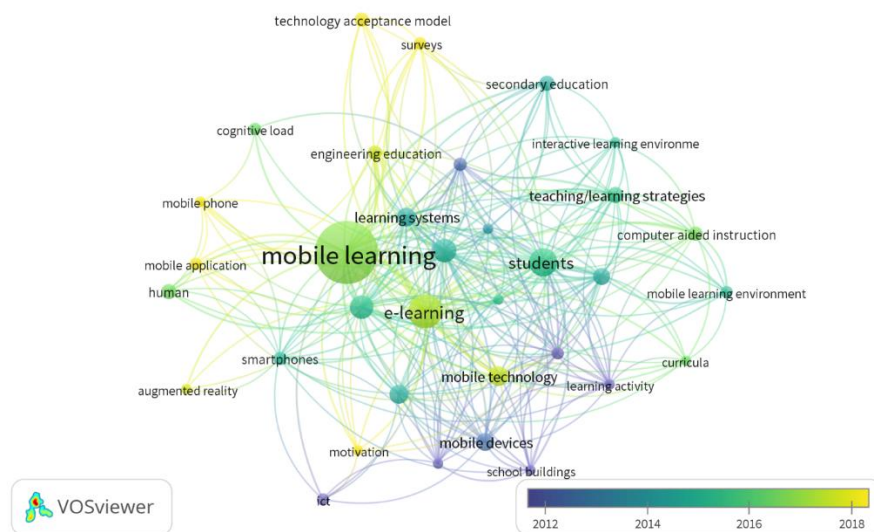
Apart from using RStudio, researchers also use Vosviewer to map research focus and see the novelty of keywords. The research focus is presented in **Figure 3**.



**Figure 3.** Network visualization (Keyword Occurrence ≥ 4).



In **Figure 3**, there are different colors according to the cluster. This shows that there are several clusters of keywords that are often linked to others. There are five clusters in **Figure 4**. The first cluster (red) consists of the word's computer science, higher education, ICT, mobile devices, motivation, school buildings, teaching and learning, and science education. The second cluster (Green) consists of the words augmented reality, cognitive load, education, human, mobile application, mobile learning, mobile phones, and smartphones. The third cluster (blue) consists of computer-aided instruction, curriculum, elementary schools, learning activities, mobile learning environment, mobile technology, and students. The fourth cluster (Yellow) consists of an interactive learning environment, learning achievement, mobile-learning system, secondary education, teaching, and teaching/learning strategy. The fifth cluster (Purple) consists of the words e-learning, engineering education, learning systems, surveys, and technology acceptance.



**Figure 4.** Overlay visualization.

The visualization displayed uses a color scheme to differentiate between research topics that have been researched for a long time, which are indicated by darker colors, and topics that are newer to research, which are indicated by lighter colors. Based on the visualization, in 2018, themes such as motivation, augmented reality, mobile apps, cell phones, surveys, and technology acceptance models stand out in yellow. This suggests that these themes were areas of recent interest in research and could be promising topics for further research due to current research interests and trends at that time.

### 3.8. Discussion

In the rapid flow of change in the world of education, we are witnessing a holistic shift that not only the way we think and approach learning but also the tools and methods we use (Andrian *et al.*, 2020; Fitriani, 2023; Hakim & Angga, 2023; Zafrullah & Zetriuslita, 2021). During this transformation, the emergence of Mobile Learning as a learning medium has become one of the most significant developments. This concept leverages increasingly sophisticated mobile technology to provide flexible and interactive access to education, enabling more adaptive and personalized learning that can be accessed anytime and anywhere. With Mobile Learning, the boundaries of the traditional classroom are broken through, providing opportunities for students to engage with learning material through devices that have become an integral part of their daily lives (Liu & Lai, 2023; Mohtar *et al.*,

2023; Salhab & Daher, 2023). This reflects an evolution in education, where learning is no longer tied to a particular place or time, but is a continuous and dynamic process that supports intellectual growth in the digital era (Alenezi, 2023).

Twenty years of analysis in the Mobile Learning field of study shows significant growth and sustainability, reflected in 209 documents produced by 98 sources with an average annual increase of 11.61%. The involvement of 602 authors, of which 16 were published independently, highlights a balance between individual initiative and extensive collaboration, with international collaboration accounting for 17.22% adding a global dimension to the research. The intellectual richness of this field is enhanced by 668 author keywords and 7865 references, demonstrating the diversity and complexity of research. The high average number of authors per document and citations per document reflects the significant collaboration and impact of this work on the world stage, underscores the productivity and broad appreciation of the field, and emphasizes the important role of individuals in a collaborative and interdisciplinary academic environment.

The increasing publication trend, especially during 2020 which marked a peak with 23 articles related to the COVID-19 pandemic, reveals increasing interest in Mobile Learning as a response to the challenges of distance education and highlights the importance of mobile technology in innovative teaching. This marks a shift towards a more integrated and flexible educational paradigm, enabling a more inclusive and dynamic learning approach, which goes beyond the boundaries of the traditional classroom and opens up new opportunities for further research and technology-oriented curriculum development to meet the diversity of student needs.

Information in the prolific affiliation highlights the diversity and breadth of global contributions to mobile learning research in schools, with the National Taiwan University of Science and Technology leading the way with 20 articles, signaling the dominance and research focus of Taiwanese and other researchers in the top ten in this field. This achievement reflects that the mobile learning arena in schools is an international endeavor involving various academic institutions committed to knowledge exchange and educational innovation, with Taiwan emerging as a possible leader in this research. The active participation of various countries demonstrates a global response to the need for uniform education and confirms that educational innovation is a collective effort that transcends geographic boundaries, promising the development of inclusive and adaptive educational solutions that are globally relevant.

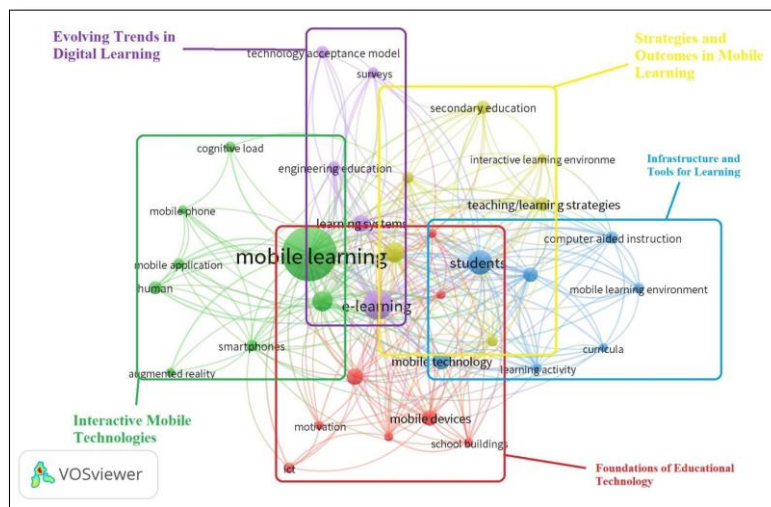
In the realm of the most productive sources, "Computers and Education" is listed as the most influential journal with an h-index of 15 and 1762 citations, marking its significance in Mobile Learning research in education. "International Journal of Mobile Learning and Organization" also earns a strong spot with an h-index of 10 and 340 citations, demonstrating its productivity and influence through 17 publications. This journal, along with the "British Journal of Educational Technology" and the "Journal of Computer Assisted Learning", has significantly contributed to the understanding of mobile learning, emphasizing the importance of accessibility and flexibility in learning. The recognition received by the literature in this area reflects the academic and practitioner community's appreciation for mobile learning, which serves as a key to educational innovation and as a tool to meet the needs of different learners in the contemporary digital environment.

National Taiwan University of Science and Technology's Gwo-Jen Hwang's leadership in the field of Mobile Learning, seen through 19 publications and nearly 2000 citations, places Taiwan at the forefront of global research. Aided by the contributions of other Taiwanese researchers and collaboration with international experts such as Matthew Kearney and Helen

Crompton, it shows the importance of Mobile Learning in education around the world. The high number of publications and citations they have received confirms the global impact of their research and makes clear the international community's commitment to advancing this learning technology. This influence underscores the transition to a new, more dynamic educational paradigm, driven by mobile technology, marking a shift towards more interactive and personalized learning methods, with Taiwan being a leading example of innovation and research in this area.

Research by [Chiang et al. \(2014\)](#) about mobile learning systems with augmented reality leading in citations confirms the great interest in the incorporation of advanced technologies in the world of education. This was followed by the study of [Chu et al. \(2010\)](#) which explored the development of location-oriented mobile learning and received almost the same attention, highlighting the effectiveness of mobile technology integrated with geographic considerations. The work of [El-Hussein & Cronje \(2010\)](#) and [Chen et al. \(2003\)](#) also received significant recognition, highlighting the need for adapting mobile learning to different educational needs. This citation interest indicates an appreciation for technological innovation in creating efficient and appropriate learning methods. Enthusiasm for research that combines augmented reality and location reflects efforts to make learning experiences more immersive and relevant. The persistence of this quote shows not only the popularity but also the ongoing impact of mobile learning in education, marking its important role in creating learning environments that are flexible and able to adapt to evolving educational needs.

**Figure 5** is the network visualization. We made the figure into several blocks.



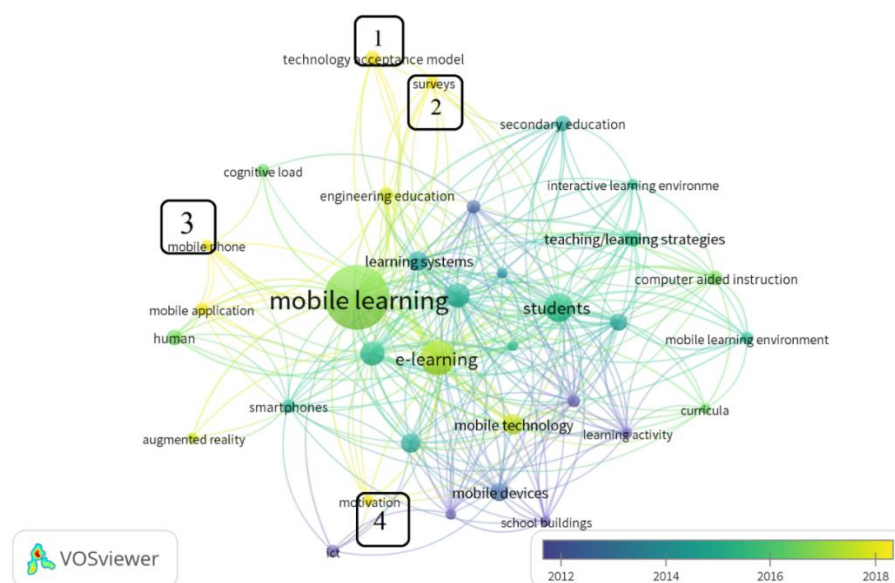
**Figure 5.** Network visualization grouping.

The cluster called Foundation of Educational Technology (Red Cluster) discusses the interaction between information technology and advanced education, analyzing how computer science and ICT (Information and Communication Technology) integrate with mobile devices to support motivation and learning in schools. Topics such as the physical structure of schools and science education were also examined, indicating an exploration into the use of technology to improve teaching and learning approaches and improvements in the infrastructure that supports them. Meanwhile, the green cluster (Interactive Mobile Technologies) reflects the meeting between technological innovation and education. In this cluster, augmented reality and mobile applications are at the forefront, highlighting the shift to more immersive teaching methods. The focus on cognitive load and human research

addresses the interactions between these technologies and human learning capacity. Keywords such as mobile learning, mobile phones, and smartphones emphasize the evolution of education towards a more flexible and accessible paradigm, freeing learning from the limitations of the physical classroom and embracing the possibilities brought by mobile connectivity.

The third cluster on the topic of Infrastructure and Tools for Learning describes the core of technology-enriched educational practices, where computer-assisted instruction, customized curricula, and learning activities in elementary schools are integrated into mobile learning environments. The focus on students is central to all these initiatives, which aim to improve engagement and learning outcomes by leveraging innovative mobile tools and technology in education. The fourth cluster (Strategies and Outcomes in Mobile Learning) emphasizes the importance of innovative and adaptive learning approaches that can improve student learning experiences, integrating mobile technology to support more dynamic and responsive interactions between teachers and students, as well as between students and their learning materials. The fifth cluster (Evolving Trends in Digital Learning) focuses on evaluating user reactions to e-learning, using surveys to measure its effectiveness and impact, and understanding factors that support or hinder the acceptance of technology in engineering education.

Based on the visualization (see **Figures 5 and 6**), themes are as motivation, augmented reality, mobile applications, cell phones, surveys, and technology acceptance models stand out in yellow. This shows that the research is still small and can be used as a novelty, especially in the context of mobile learning in schools. The yellow color marking these themes confirms that they are a growing trend and offer potential for innovation that has not yet been fully explored in the educational literature. This provides an opportunity for educational researchers and practitioners to investigate more deeply how factors such as student motivation and technology acceptance influence the use of mobile learning. In particular, augmented reality and mobile applications, which are becoming increasingly popular among students, can be valuable tools for improving engagement and learning outcomes in diverse educational environments. Thus, expanding research in this area could be very beneficial in developing teaching methods that are more interactive and responsive to modern educational needs.



**Figure 6.** Identification of the latest keywords in the overlay visualization.

#### 4. CONCLUSION

From the results of the analysis that has been carried out, it can be concluded that the two decades of analysis show significant growth in Mobile Learning studies, with 209 documents published by 98 sources and active participation from 602 authors, highlighting the synergy between individual and collaborative efforts in research that has a global reach. A special focus in 2020 illustrates the vital role of Mobile Learning in addressing educational challenges during the pandemic. The dominant contribution from Taiwan, especially through the National Taiwan University of Science and Technology and lead researcher Gwo-Jen Hwang, confirms the country's position as a leader in Mobile Learning research. Meanwhile, the journal "Computers and Education" emerged as the main source of literature. Topics such as motivation, augmented reality, mobile applications, cell phones, surveys, and technology acceptance models show potential that has not yet been fully explored, promising innovations in Mobile Learning applications in schools.

#### 5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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