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# Exploring Research Idea Growth with Litmap

## Visualizing Literature Review Graphically

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## Abstract

*This study presents a method for tracking the growth of research studies in a particular field or topic using a graphical representation of literature review with the help of Litmap. The step-by-step method involves selecting an article or a set of articles that represent the topic of interest and using Litmap to analyze and visualize the relationships between different concepts and ideas. The study starts with the article entitled "The role of mobile learning on the learning environment shifting at high school in Indonesia" written by Sulisworo et al. Litmap serves as a valuable tool for researchers during the process of writing scientific articles, as it allows for visual mapping and tracking of the development of research articles, identification of key articles or authors, exploration of citation patterns and influences, and contextualization of research within the existing literature. The visual representation provided by Litmap can also aid in identifying significant citations, highlighting influential articles, and identifying potential areas for further research. Overall, Litmap can enhance the literature review process, improve the quality of scientific articles, and contribute to the advancement of knowledge in various fields.*

***Keywords:*** *literature review, Litmap, research idea, visualizing graphically*

## Introduction

It is important to know about the growth of research ideas because it helps researchers to understand the current state of knowledge in their field and identify areas where further research is needed. By tracking the growth of research ideas, researchers can identify emerging trends and research gaps that need to be filled. Moreover, understanding the growth of research ideas can also help researchers to better position their own work within the broader research landscape. By understanding how their research idea relates to others in the field, researchers can better articulate the significance and novelty of their work, as well as identify potential collaborators and funding sources. Overall, tracking the growth of research ideas is an important part of staying up-to-date with the latest developments in a field and advancing the state of knowledge through innovative research.

One of the application to track the research growth is Litmap. Litmap is an application that can be used to track the growth of research ideas. Litmap is a web-based platform that provides a graphical representation of literature reviews and allows users to visualize and explore the relationships between different concepts and ideas in a given body of literature. The Litmap application uses natural language processing and machine learning algorithms to analyze the text of academic papers and create a visual representation of the literature review. The resulting map allows users to see the relationships between different concepts and ideas, identify key themes and trends, and explore the literature in a more intuitive and interactive way.

"Litmap" stands for "literature map," which is a visual tool that presents the relationships between different concepts and ideas in a given body of literature. By using a Litmap, researchers can gain insights into the development of their field of study and identify gaps in knowledge that may require further investigation. The map allows researchers to see how different topics are related and how research has evolved over time. This can help them to identify new research questions and design more effective research studies. This study aims to use a graphical representation of literature review to track the growth of research studies in a particular field or topic.

## Methods

Litmap, which is a tool used for graphical representation of literature review and tracking the growth of research studies and available at https://app.litmaps.co/. It has three main menus as Fig. 1.

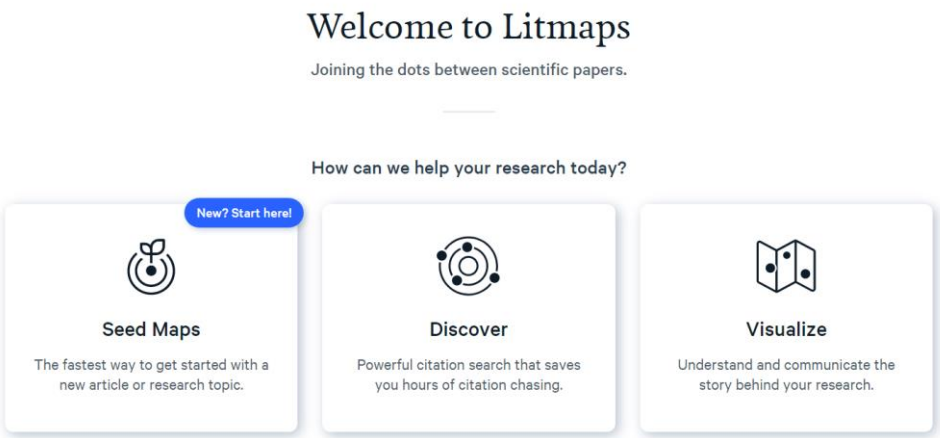


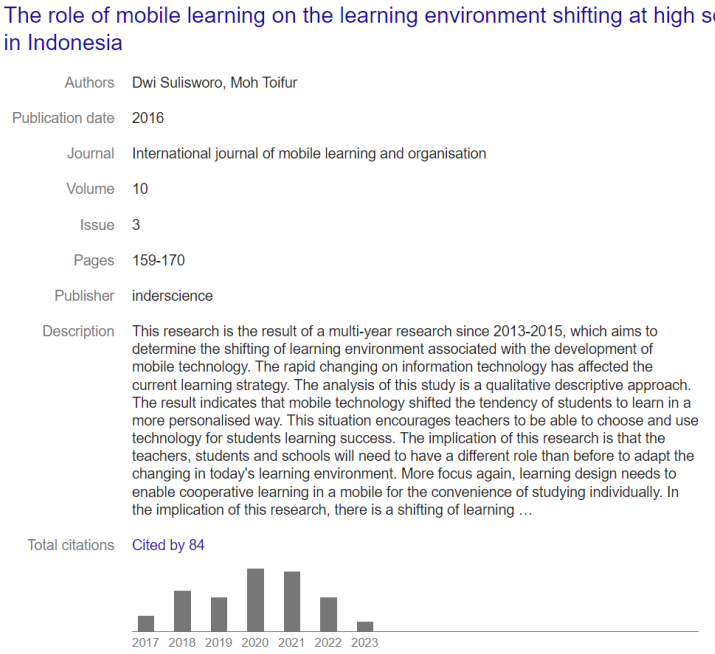

**Fig. 1.** Litmap menus

Here is a step-by-step method for using Litmap to track the growth of research ideas:

1. Choose an article or a set of articles that represent the topic or field of interest.
2. Use the Litmap application to analyze the selected article(s). Upload the article(s) to the Seed menu and let Litmap extract the relevant information.
3. Use the Discover menu to explore the different aspects of the article(s), such as the main themes, concepts, and ideas. This will allow you to identify the key areas of research and their relationships.
4. Use the Map menu to visualize the relationships between different concepts and ideas. This will allow you to see how the research has evolved over time and identify the key trends and themes in the literature.

In this study, we staretd with the article entitle: The role of mobile learning on the learning environment shifting at high school in Indonesia written by Sulisworo et al. [1]. See Fig. 1 for the detail description of this paper.

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The role of mobile learning on the learning environment shifting at high sch
in Indonesia

Authors Dwi Sulisworo, Moh Toifur

Publication date 2016

Journal International journal of mobile learning and organisation

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Description This research is the result of a multi-year research since 2013-2015, which aims to determine the shifting of learning environment associated with the development of mobile technology. The rapid changing on information technology has affected the current learning strategy. The analysis of this study is a qualitative descriptive approach. The result indicates that mobile technology shifted the tendency of students to learn in a more personalised way. This situation encourages teachers to be able to choose and use technology for students learning success. The implication of this research is that the teachers, students and schools will need to have a different role than before to adapt the changing in today's learning environment. More focus again, learning design needs to enable cooperative learning in a mobile for the convenience of studying individually. In the implication of this research, there is a shifting of learning …

Total citations Cited by 84

2017 2018 2019 2020 2021 2022 2023

**Fig. 2.** The article identity from Google Scholar site

## Results and Discussions

Figure 2 represents the result of a literature review or a mapping of the development of an article written by Sulisworo & Toifur [1], using a tool called Litmap. This tool may have been used to visually represent the connections or relationships between Sulisworo's article and other relevant articles in the form of a graphical map. The selection of Sulisworo's article as an example in Figure 1 may illustrate the utilization of Litmap for tracking the development of research in the field of study. It could indicate how Sulisworo's article serves as a central point or "seed" from which other articles are connected or cited, even though they may not directly reference Sulisworo's article. This could suggest the influence or significance of Sulisworo's work in the field and how it has contributed to the body of literature on the topic.

The use of Litmap or similar tools can help researchers visually represent the relationships and connections between articles, which can provide insights into the development and evolution of research in a particular field, identify key articles or authors, and explore the citation patterns and influences among scholarly works. From Figure 2, it can be inferred that the article under study (located in the center with a seed symbol) is rooted in Vygotsky's article [2], although not directly referenced by the researchers. In other words, the study on mobile learning is grounded in constructivist psychology.

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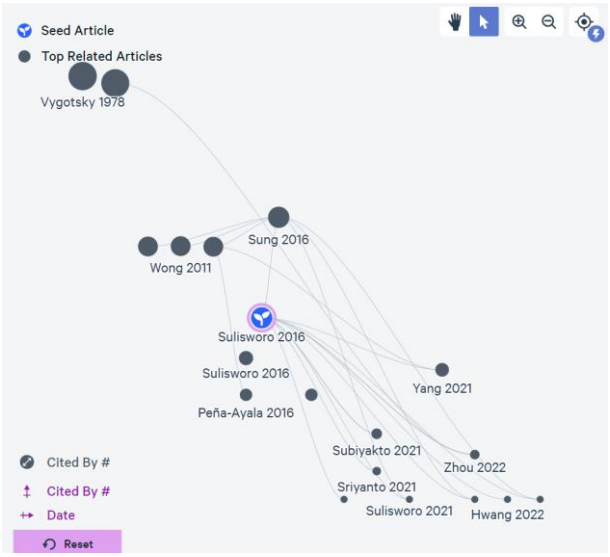



**Fig. 3.** The growth of the article

Constructivist psychology is a theoretical framework that emphasizes how individuals actively construct their own knowledge and understanding of the world through their experiences and interactions. It suggests that learning is a dynamic and active process where learners actively build new knowledge by integrating new information with their existing cognitive structures and prior experiences.

In the context of mobile learning, constructivist psychology can be applied to understand how learners engage with mobile devices and technologies to construct their knowledge and meaning in the learning process. Mobile learning refers to the use of mobile devices, such as smartphones and tablets, for educational purposes. Constructivist principles can guide the design and implementation of mobile learning experiences that encourage learners to actively engage in constructing their own understanding of the learning material.

For example, in a mobile learning environment, learners can actively explore, analyze, and reflect on information, collaborate with peers, and create their own content, all of which align with constructivist principles. Mobile devices can provide learners with opportunities for authentic, contextualized, and personalized learning experiences that allow them to actively construct their knowledge and meaning based on their unique perspectives, interests, and interactions with the environment. By applying constructivist psychology to mobile learning, educators and researchers can design and implement effective mobile learning strategies that promote active engagement, critical thinking, and deep understanding among learners. This can lead to more meaningful and effective learning experiences, as learners actively construct their own knowledge and apply it in real-world contexts through mobile devices. Fig. 2 can be highlighted to see the studies that cite the article (Fig. 3).

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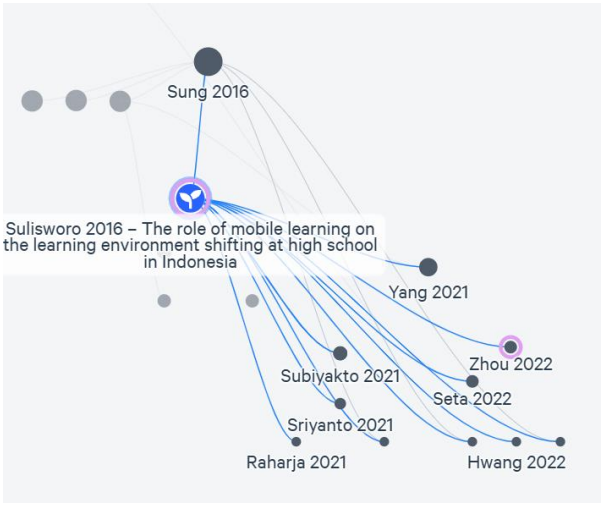



**Fig. 4.** The impact of the article

In Figure 3, several studies can be seen that significantly cite the study under review. There are at least 11 articles that reference this study. The study by Sung et al. [13] has the highest number of citations, as indicated by the larger circle compared to others. The study by Ref. [3] is also referenced together with the study by Ref. [1] by other researchers i.e Sulisworo et al. [4], Arinova et al. [5], Setianingsih et al. [6]. The study by Ref. [1] appears to still have potential for further research, as seen from the number of articles published in the last five years that cite it. There are at least more than ten articles shown in the graph by Yang et al. [7], Subiyakto et al. [8], Sriyanto & Sukarelawan [9], Raharja [10], Zhou [11], Hwang [12], Arizona [5], and Setianingsih [6]. All these detail paper can be found at the left of the graph. See Fig. 5.

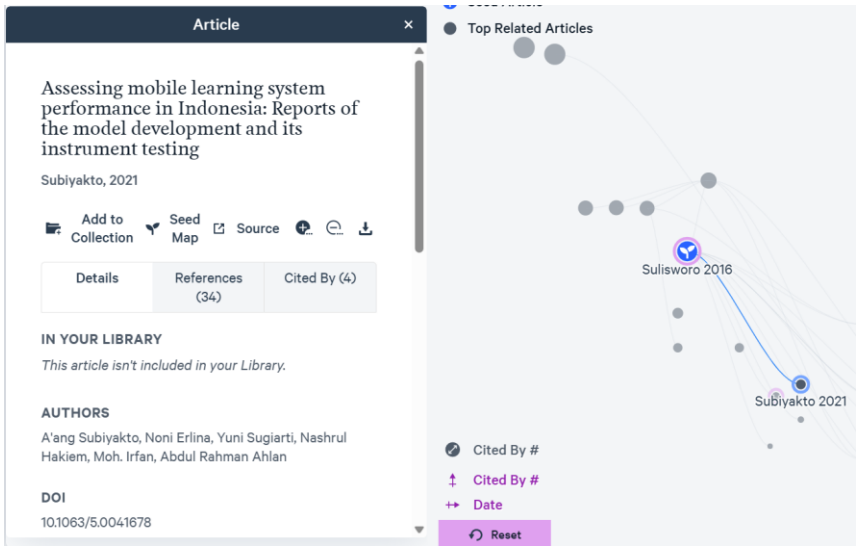



**Fig. 5.** The detail information of the 'dot' of the auhtor

Litmap is a tool that provides researchers with the ability to track the connections and relationships between articles. It allows researchers to explore the interrelatedness of articles, identify citation counts and references, and obtain information about the identities of the articles. This information can include details such as authors, publication dates, and journal titles, which can be

helpful in understanding the context and background of the articles being analyzed. Furthermore, Litmap also allows researchers to download related files, such as full-text articles or supplementary materials, for in-depth analysis. This feature can facilitate further examination and exploration of the articles, enabling researchers to gain a deeper understanding of the literature and its implications for their research. Overall, Litmap provides valuable insights and resources that can enhance the research process and contribute to the quality of scientific analysis and interpretation.

## Conclusion

Litmap can serve as a valuable tool for researchers during the process of writing scientific articles. It enables researchers to visually map and track the development of research articles, identify key articles or authors, and explore citation patterns and influences among scholarly works. By using Litmap, researchers can gain insights into the connections and relationships between articles, which can help them contextualize their own research within the existing literature and identify relevant sources to support their arguments and claims. The visual representation provided by Litmap can also facilitate the identification of significant citations, highlight articles with high impact or influence, and identify potential areas for further research. Overall, Litmap can be a useful tool for researchers to enhance their literature review process, improve the quality of their scientific articles, and contribute to the advancement of knowledge in their respective fields.

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