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Systematic Literature Review: Mathematics Teaching Materials Assisted with Live Worksheet

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ABSTRAK

Penggunaan bahan ajar matematika berbantuan *live worksheet* dapat meningkatkan minat siswa dalam pembelajaran matematika namun masih jarang digunakan. Penelitian ini bertujuan untuk melakukan tinjauan pustaka terkait bahan ajar matematika berbantuan *live worksheet*. Metode yang digunakan dalam penelitian ini adalah *Systematic Literature Review* (SLR) yang terdiri dari 38 penelitian bahan ajar matematika berbantuan liveworksheet di rentang tahun 2019 – 2023 yang diambil dari jurnal terindeks SINTA 2 dan 3. Pertanyaan kunci dalam penelitian ini adalah bagaimana artikel-artikel tersebut didistribusikan berdasarkan tahun penerbitan, jenjang pendidikan, topik matematika, dan metode penelitian yang digunakan. Hasil penelitian menunjukkan bahwa penelitian terkait bahan ajar matematika berbantuan *live worksheet* paling banyak dilakukan pada tahun 2023 dan mengalami tren peningkatan, penelitian paling banyak dilakukan pada jenjang SMP, pada topik geometri, dan menggunakan metode penelitian *Research and Development*.

Kata Kunci: Live Worksheets; Systematic Literature Review; SLR.

ABSTRACT

Using mathematics teaching materials assisted by live worksheets can increase students' interest in learning mathematics but is still rarely used. This research aims to conduct a literature review regarding mathematics teaching materials assisted by live worksheets. The method used in this research is Systematic Literature Review (SLR) which consists of 38 studies of mathematics teaching materials assisted by live worksheets in the period 2019 – 2023 taken from indexed journals SINTA 2 and 3. The key question in this research is how these articles are distributed based on year of publication, level of education, mathematics topic, and research methods used. The research results show that most research related to mathematics teaching materials assisted by live worksheets will be carried out in 2023 and is experiencing an increasing trend, most research will be carried out at the junior high school level, on geometry topics, and using the Research and Development research method.

Keywords: Live Worksheets; Systematic Literature Review; SLR.

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1. INTRODUCTION

Mathematics is one of the important subjects for students to master. This is because everything in our lives cannot be separated from mathematics. Mathematics lessons are useful lessons for human survival because mathematics is a science that allows humans to think logically (Yudha, 2019). Therefore, mathematics lessons are mandatory lessons for students to learn from an early age. Furthermore, mathematics is a lesson that requires more concentration and high interest. Therefore, mathematics teachers must be able to present mathematics lessons interestingly so that students' interest and concentration can be maintained or even increased during mathematics lessons. Interesting mathematics learning will motivate students to learn mathematics with more enthusiasm (Cahyati et al., 2023). Interesting mathematics lessons have been proven to increase students' interest in learning. Things that need to be considered to create mathematics learning that interests' students are creating interesting mathematics teaching materials. Interesting mathematics teaching materials are interactive teaching materials and get more attention from students to learn mathematics. Using interactive teaching materials in the learning process can increase efficiency, motivation, activity, and consistency, with student-centered learning to learn better (Latifah & Utami, 2019). Interactive teaching materials by adding interesting student activities so that students are motivated to be more active during learning. Interactive teaching materials can be realized, one of which is by using digital technology (Elyana, Wulandari, & Mulyani, 2022). The implementation of digital teaching materials is very important to support student learning success to increasing interest in learning (Mahessya et.al, 2022). The use of digital-based interactive teaching materials can support student learning independence and be adjusted to the needs of each student (Nurhairunnisah & Sujarwo, 2018; Anita et al., 2021). Thus, a mathematics teacher needs to design interesting learning by creating interactive teaching materials, namely teaching materials that are integrated with digital technology.

The importance of creating interactive teaching materials by mathematics teachers is not in line with its application in schools. According to Nuritno and Raharjo (2017), interactive teaching materials are still rarely used during mathematics learning so students are less interested in learning mathematics. Mathematics learning carried out in the classroom tends to still use teacher-centered learning so that students are less active in learning (Kusuma et.al., 2020). The teaching materials used by teachers during learning also still use physical paper so that after the learning is finished, the paper is no longer used or can even be lost if students do not store it properly. This makes it difficult for students to relearn what has been learned in class. This problem can be solved by using digital technology-assisted teaching materials (Saputro et al., 2024). In addition, digital technology-assisted teaching materials are also an alternative to make

students more interested in mathematics lessons. One platform that can help create digital teaching materials is live worksheets (Ismaniar, Sumarni, & Riyadi, 2024).

Live Worksheet is a website platform that can help teachers create interactive teaching materials (Ramadoni, Aima, & Mardiyah, 2024). On the live worksheet website, teachers can explore the creation of teaching materials with their creations or see the results of other teachers' teaching materials. Live Worksheet is a website that can make it easier for teachers to design teaching materials to be more varied and liked by students (Amalia & Lestyanto, 2021). Live worksheets are one example of digital-based mathematics teaching materials that allow teachers and students to access, interact, and practice mathematical concepts more dynamically and interactively (Qudwatullathifah et.al, 2023). In addition, Firtsanianta and Khofifah (2022) stated that live worksheets can help students learn independently and make it easier for students to learn mathematics because of their attractive appearance and easy access. Teaching materials assisted by live worksheets can overcome the problem of learning mathematics that is less interesting to students, namely by creating interactive teaching materials.

The creation of interactive mathematics teaching materials assisted by live worksheets is important because it can increase students' interest and enthusiasm in learning mathematics. Therefore, research is needed to develop mathematics teaching materials assisted by live worksheets. Based on the literature review conducted by the researcher, there are no articles on the topic of mathematics teaching materials assisted by live worksheets that use the Systematic Literature Review method. Therefore, this research was conducted as an aid for researchers who are interested in studying the use of mathematics teaching materials assisted by live worksheets at all levels of education, the mathematics topics presented, and the methods used.

2. METHOD

This study uses the Systematic Literature Review (SLR) method to find, assess, evaluate, and interpret all existing research on the topic of the phenomenon of interest, along with several related research questions, this research approach is carried out by collecting and analyzing research that is connected to a particular topic focus (Triandini, 2019). By using a systematic and specific approach to find, select, and assess highly significant research and to collect and analyze data from research published in scientific papers, the SLR technique is a review of a clearly stated topic (Juandi, 2021). In general, SLR consists of 3 major parts, namely planning, development, and results (Kitchenham et al, 2009). The specifics of each step are explained below:

Part 1: Planning

Planning involves evaluating the need for a review, formulating research questions, selecting databases, conducting keyword searches, and outlining inclusion and exclusion criteria. The following are the research questions for this SLR:

1. How is the distribution of articles on mathematics teaching materials assisted by live worksheets reviewed from the year of publication?
2. How is the use of mathematics teaching materials assisted by live worksheets at all levels of education?
3. How is the distribution of articles on mathematics teaching materials assisted by live worksheets reviewed from the mathematics topics presented?
4. How is the distribution of articles on teaching materials assisted by live worksheets based on their research methods?

The process uses Publish or Perish 8 software and considers several inclusion criteria, including:

1. Research conducted between 2019 and 2023
2. Articles indexed by SINTA 2 and SINTA 3
3. Research published in articles
4. Research focuses on mathematics learning
5. The research clearly states the specific mathematics topics investigated and the level of education of the subjects involved.

Part 2: Development

At the development stage, primary research was conducted without any filtering. Then, inclusion and exclusion criteria were used to filter the research, and finally, data extraction and data synthesis were carried out. This study uses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standard. PRISMA establishes a standardized peer review method that utilizes a best practice checklist to help ensure the accuracy and repeatability of the revision process (Conde et al., 2020). The core components of PRISMA are identification, screening, eligibility, and inclusion.

The steps of PRISMA are outlined as follows:

Stage 1: Identification

Keyword search "math live worksheets": 60 articles were obtained on Google Scholar.

Stage 2: Screening

Based on the inclusion and exclusion criteria, 42 articles remained

Stage 3: Eligibility

Based on the results of the previous step, 2 articles only discussed the need for analysis, and 3 articles did not integrate mathematics teaching materials with Islamic values but rather integrated learning models and learning approaches. through this eligibility process 5 articles

Stage 4: Inclusion

Based on the results of the previous process, 36 articles were obtained that were suitable/eligible for conducting a literature study

Part 3: Results

This stage involves methodical analysis and discussion of the reported results, leading to the conclusion of the SLR. Trends, study shortcomings, and suggestions for further investigation are also mentioned.

3. RESULT AND DISCUSSION

a. Results

The results of this study are compiled based on previously created research questions so that data will be presented on several articles reviewed from the year of publication, level of education, mathematics topics, and research methods. Based on the application of the PRISMA method in selecting relevant articles, 38 articles were selected from Sinta 2 and 3 indexed journals which will be presented in the form of tables and diagrams to facilitate the interpretation process.

Study Based on Year of Publication

The first thing to pay attention to is the year of publication. At the search stage related to mathematics teaching materials assisted by live worksheets, 38 articles have a distribution based on the year of publication as presented in Table 1 below:

Table 1. Number of Studies Based on Publication Year Criteria

Publication Year	Frequency
2019	-
2020	-
2021	5
2022	14
2023	19

Based on Table 1, it can be seen that in the last five years, only the last three years have conducted research related to mathematics teaching materials assisted by live worksheets. Each year there has been a significant increase, especially in 2021 (n = 5), then it increased rapidly in 2022 (n = 14) and finally increased again in 2023 (n = 19). There was no research on mathematics teaching materials assisted by live worksheets indexed by SINTA 2 or 3 in the 2019-2020 period.

Studies Based on Education Level

Table 2 shows the distribution of research related to teaching materials assisted by live worksheets based on the sample education level.

Table 2. Number of Studies Based on Education Level Criteria

Educational level	Frequency
Elementary School	11
Junior High School	15
Senior High School	10

University	2

Based on the results in table 2, can be seen that studies about mathematics teaching materials assisted live worksheets spread throughout the level school and still Possibly used at the university level. Research was most conducted at the junior high school level (n=15), followed by elementary school level (n=11), high school level (n=10), and university level. study with the quantity lowest (n=2).

Study-Based Topics Mathematics

Here is a list of materials mathematics teaching materials assisted live worksheets that have been developed through various studies:

Table 3. Number of Studies Based on Topics Mathematics

Topics Mathematics	Frequency
Number	10
Algebra	12
Geometry	15
Statistics & Probability	1

Based on Table 3 it can be seen that most topics use assisted teaching materials live worksheets are in the category geometry (n=15), then to be continued with category algebra (n=12), numbers (n=10), and finally statistics and probability (n=1).

Study Based on Research Methods

Following this are related data methods used in research about mathematics teaching materials assisted live worksheets:

Table 4. Number of Studies Based on Research Method

Topics Mathematics	Frequency
Quantitative	8
Qualitative	8
R&D	22

Based on the table above, type R&D research is the most used by researchers for study related mathematics teaching materials assisted live worksheets namely as many as 22 articles.

b. Discussion

Based on the results, the most significant developments occurred in the range 2021-2022 where year the year transition post-pandemic needed accommodating learning online or offline. This happens Because live worksheets are very helpful for teachers and students to carry out online or offline learning optimally (Zakirman & Aufiana, 2023). Seeing the trend, the study of mathematics teaching materials assisted live worksheets potential will be increased in the years to front.

Using live worksheets becomes a potential option for use in mathematics teaching materials so that they can add interest to students. Assisted mathematics teaching materials and live worksheets can increase the interest of students in learning because students can directly get bait to come back that supports student Study in a way independent and there is Lots of features that Can adapt to condition students (Retno, 2022). One of the conditions for students who can facilitate with the use of live worksheets is the age more students carry related to their level of education. Based on the results in Table 2, assisted teaching materials live worksheets can assist teachers in learning at school from elementary school level to high school. This is because the of use live worksheets on learning can be customized based on the level as well as teacher creativity in making mathematics teaching materials on the platform (Kurniawati & Nusantara, 2022). Thus, the use of mathematics teaching materials assisted live worksheets potential can help teachers create more teaching materials interesting and interactive at elementary school level with high school.

Mathematics teaching materials are tools for teachers to be able to convey the topic of mathematics with good as well as can understood by students. Topics mathematics can categorized become four groups according to TIMSS standards, namely numbers, geometry, algebra, as well as statistics, and probability (Prasetyo & Rudhito, 2016). The results in Table 3 indicate that using live worksheets can assist teachers in making mathematics teaching materials on various topics. More continue, mathematics teaching materials assisted live worksheets can make it easier for students to understand material geometry (Rifky et.al, 2022). This is because the of use live worksheets can help students imagine abstract objects and become clearer with the help of existing features (Fitriani et.al., 2021). Based on the matter, the use of mathematics teaching materials assisted live worksheets potential can help understand students in various categories of mathematics.

Research methods used in this research related mathematics teaching materials assisted live worksheets become important thing for traced Because will influence focus research conducted (Alifullah, 2023). Based on Table 4, it is seen that the method research used in the study about assisted teaching materials live worksheet is method study Research and Development (R & D). R&D research conducted uses design ADDIE, 4D, 3D, and Plomp research. Research and development are a study systematic that includes stage designing, developing, and evaluating models, programs, teaching and learning strategies, and tools, products, and systems as solutions to problem-complex education, and aims to increase knowledge about the characteristics of models, programs, teaching and learning strategies, and tools, products, and systems (Haviz, 2016). In this case, these mathematics teaching materials assisted live worksheets developed will used by teachers or students for learning mathematics in the future.

Based on the characteristics said, R&D research becomes a lot of research used in mathematics teaching materials assisted live worksheets.

4. CONCLUSION

This study's Systematic Literature Review concludes that study-related mathematics teaching materials assisted most live worksheets carried out in 2023 and experienced a trend increase. Most research conducted at the junior high school level, on the topic of geometry, and using method study Research and Development. This research is expected to be a reference for conducting further research related to teaching materials assisted by live worksheets, especially related to the selected mathematics topics, the research methods used, and the desired form of presentation of live worksheet teaching materials.

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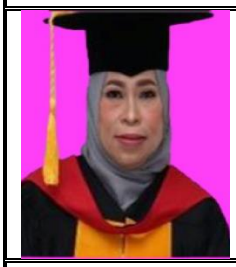

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