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# Systematic Literature Review: Effectiveness of a Teaching Aid Based on the Achievement and Interest of Students in the Field of Measurement and Geometry

**Fatin Nur Dania Shaimi**
Universiti Pendidikan Sultan Idris, MALAYSIA

**Shazlyn Milleana Shaharudin***
Universiti Pendidikan Sultan Idris, MALAYSIA

**Mazlini Adnan**
Universiti Pendidikan Sultan Idris, MALAYSIA

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**Abstract:** The purpose of this systematic literature review (SLR) is to identify: (a) the topic of the study, (b) the research methods used, and (c) the results of research on Mathematics education in Malaysia. This study discusses the use of teaching aid (TA) in the field of syllabus and geometry for Form 2 students. The use of TA is considered highly successful and relevant for educators to improve the quality of the teacher's instructions and students' understanding. Therefore, using the rules of optional reporting items for systematic review and meta-analysis (PRISMA), a review system was carried out to determine the appropriate strategies and variables for the field. Four stages constitute the PRISMA paradigm used in this study: identification, screening, qualification, and admission. Using criteria opted by researchers from multiple searches, including Google Scholar, ResearchGate, Scopus, and Emerald, over 20 papers were identified for additional investigation. The data were then analysed quantitatively to describe the research's findings. From the results, two main research themes were found, namely (a) learning to use TA; and (b) the field of measurement and geometry of Mathematics. The results of the article analysis indicate that Mathematics education in Malaysia is currently at a moderate level and is ineffective at fostering students' understanding and interest. These results are anticipated to serve as the foundation for teachers, students, schools, and the Ministry of Education to undertake more engaging and interactive learning, particularly in the subject areas of mathematics and geometry.

**Keywords:** *Geometry, isometric transformation, mathematics, teaching aids.*

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## Introduction

Employing a teaching aid (TA) in the teaching and learning process (TL) significantly ensures that teachers' delivery of information during the lessons is comprehensible and systematic and can considerably improve students' ability to understand. Based on Kasa and Md Aroff (1995) definition, TA refers to any kind of materials that can be used, exploited, and mobilised to facilitate any process of learning and teaching. TAS can be classified into two types–electronic and non-electronic TAs–and their primary function in TL is ensuring a more effective process of teaching (Abdullah et al., 2018).

Several examples of TAs have been built in the field of measurement and geometry, either materially, i.e., the construction of kits and modules, or abstractly, i.e., the use of software such as Geometer Sketchpad. This TA has been developed by Malaysian researchers based on the Curriculum and Assessment Standard Document (DSKP).

The TL needs to be conducted interactively to boost students' understanding. According to Lan and Ismail (2016), the fact that Chalk and Talk teaching methods are no longer relevant in the 21st century needs to be acknowledged. Therefore, teaching aids are vastly significant in today's world of education. In the TL process, without teachers' innovation, learning will be lifeless (Samsudin et al., 2013). Teachers need to be creative and innovative to craft effective learning and teaching processes. Zanzali and Daud (2009) also supported this argument and pointed out that the lack of use of TA by teachers in the TL process results in a monotonous learning environment.

* **Corresponding author:**
Shazlyn Milleana Shaharudin, Department of Mathematics, Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, Malaysia.
✉ shazlyn@fsmt.upsi.edu.my

Because they make up the most principal topics in the examination, the fields of learning measurement and geometry as the focus areas of this study. The Trends in International Mathematics and Science Study (TIMSS, 2019) stated that the test times reserved for topics under measurement and geometry are as much as 30%. Moreover, the TIMSS report correspondingly affirmed that the achievement in geometry in mathematics of primary school students in Malaysia is less satisfactory than that of primary school students in other Asia Pacific countries (Abdullah & Wei, 2017). Despite the average students still having difficulties in applying formulas and a lack of understanding of theorems, most students generally still struggle to understand mathematical problems (Omar et al., 2017).

Therefore, in Malaysian context lacks research on TA. To identify a proper TA, a systematic literature review needs to conduct to get ideas for the development of TA which are suitable to build. In addition, this review focuses on the effectiveness of TA during the TL in the classroom. The field of focus is measurement and geometry for secondary mathematics in Malaysia.

## Literature Review

Lessons in mathematics are learnings that test a person's intelligence to solve problems critically, aided by memory of mathematical concepts, facts, and procedures. As science and technology evolve, various advanced tools are designed and created to solve mathematical problems.

The process of transformation in the education field requires a drastic change from a conventional TL to a modern learning approach by using high-tech TAs in line with the present-day demand. A teacher's tasks have become increasingly challenging due to the ever-changing era of globalisation, both positively and negatively (Zain, 2002). Teachers who use the current TA or develop a new TA for the R&D process might model their creativity and innovation after creative and innovative teachers. According to the study by Jasmi et al. (2011), TA helps teachers increase the efficiency of student-centered learning by acting as a facilitator.

Essentially, students' level of interest heavily affects their achievement. Lan and Ismail (2016) pointed out that interest can determine whether the students flourish of lag in the subject of Mathematics. Students won't be motivated to learn if the subjects do not appeal to their interests. Additionally, from Lan and Ismail (2016) findings, interest is related to the feeling of liking or pleasure from a person towards an object or thing. It is also closely related to internal motivation where a person's interest in an object will be more pronounced when the object is in line with their targets, desires and needs. Based on the study by Ahmad et al. (2018), teachers need to be more creative and innovative in implementing learning and teaching so that students can learn and master knowledge more effectively.

Abu and Leong (2014) stated that students are interested in the subject of Additional Mathematics because of the teacher's teaching. In their study, it is demonstrated a direct relationship between students' interest in the subject of Mathematics and their achievements. When students show a high level of interest, they perform well in the subject. Conversely, students' negative attitude and low commitment to the subject affect their achievements.

According to Zanzali and Daud (2009), traditional teachings, such as the Chalk and Talk method, were no longer relevant for teachers in the TL process. It is necessary that teachers adapt to the use of technology in the TL process to increase students' interest in a subject they learn, promoting a more interactive learning method.

The study was re-conducted by Kosnin and Abdullah (2008), demonstrating the effectiveness of Geometer's Sketchpad (GSP) software in improving students' visual ability and achievement levels in geometry construction. The findings of the study showed that the use of GPS software was suitable for the construction of geometry in form 2 Mathematics topics as it improved students' performance.

In a study by Abdullah and Wei (2017), students could not identify the geometric shapes and features in question. For example, some students were still unfamiliar with the names of shapes in the context where they were unable to distinguish a cube from a cuboid.

Yanık and Ada (2013) conducted a study to examine the development of students' skills to define, construct, and classify polygons in geometry courses with Cabri Geometry II Plus geometry software. Their study revealed that students had problems understanding and classifying the relationship between mathematical meanings. Therefore, the study focuses on the use of TAs in the form of software that could help students with their difficulties. This statement proves the importance of the roles played by TA in helping students to understand a topic comprehensively.

Various TAs have been developed in accordance with pertinent mathematical disciplines and fields. Usually, teachers develop TA for topics that are challenging for students to understand and topics that demand a substantial amount of visualisation processes. Several factors contribute to this situation, including a student's ability to visualise. Since most Malaysian students face many problems in measurement and geometry, this field was chosen. A TA used in Malaysian schools for topics related to measurement and geometry is the Geometer's Sketchpad (GSP) software developed by Nicholas Jackiw in 1991.

With the development of this software, students can easily understand concepts, especially for topics related to angular properties of circles, angles, circumferences of circles, transformations, and geometric constructions. According to

Kosnin and Abdullah (2008), GSP Software builds, explores, and analyses widely in the field of mathematics. Although this software is a technological teaching aid, there are still limitations on how teachers can utilise it. Therefore, various types of TA are still required to help students in the mathematics teaching and learning process.

## Methodology

The preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines established by Moher et al. (2015) were followed in the construction of this systematic review. The method used to find articles about the construction and usefulness of the teaching aid as a teaching tool for the measurement and geometry topics for the academic achievement and interest of second-grade students is covered in this section. The method to conduct the systematic review, eligibility and exclusion criteria, review process steps (identification, screening, eligibility), and data abstraction and analysis is known as PRISMA.

### *PRISMA*

PRISMA offers three distinct benefits, according to Sierra-Correa and Cantera Kintz (2015), including 1) distinctly identifying research questions that permit systematic research, 2) identifying inclusion and exclusion criteria, and 3) attempting to review a substantial database of scientific literature within the allotted time frame. This method offers a widely established methodology that utilises checklists of recommendations to improve the quality assurance and reproducibility of the review process (Moher et al., 2015). The Transiso Kit can be developed and used most effectively as a teaching tool in the areas of measurement and geometry for the achievement and interest of second-grade pupils by following the PRISMA standards.

### *Source*

Scopus and Web of Science are the main journal databases for finding empirical research. Based on PRISMA guidelines, this systematic review presents important phases, including (a) eligibility and exclusion criteria; (b) identification review; (c) screening; (d) eligibility; and (e) data abstraction and analysis (Moher et al., 2015). Selection is based on (a) impact assessment; (b) availability of open-access journals; and (c) various academic disciplines.

### *A Systematic Review Process*

#### *i) Identify*

Finding the search terms is the initial stage in the procedure. The title's keywords were attained using various sources from earlier investigations. As a result of the search, two questions related to the title of the study were created. Furthermore, in the process of identifying these, the researcher determined the right keywords and researched a large number of studies to ensure the reference of as many quality studies as possible.

#### *ii) Screening and eligibility*

*Table 1. Eligibility and Exclusion Criteria*

| No | Eligibility Criteria | Exclusion Criteria |
|---|---|---|
| 1 | Journal articles written by Malaysian or foreign authors. | National or international seminar proceedings. |
| 2 | Year of publication is the most recent 5 years. | Published over 10 years. |
| 3 | Articles in Malay and English. | Articles in non-international languages. |
| 4 | Published in internationally renowned journals. | Articles published in local or international journals are not reputable. |

Based on Table 1, it is known that the eligibility criteria in the search for journal articles are limited, allowing the researcher to analyse quality journal articles to achieve the objectives.

#### *iii) Abstraction and Data Analysis*

Twenty articles were examined and reviewed. Upon examining the article's abstract, the whole (in-depth) article was reviewed to determine the themes and sub-themes. Twenty articles on the creation and impact of the Transiso Kit on two variables for lower secondary students were analysed using qualitative content analysis to identify common themes. By categorising and organising findings based on their similarities to other findings or their relevance, researchers can identify the conclusions of earlier studies using systematic analysis (Adams et al., 2021).

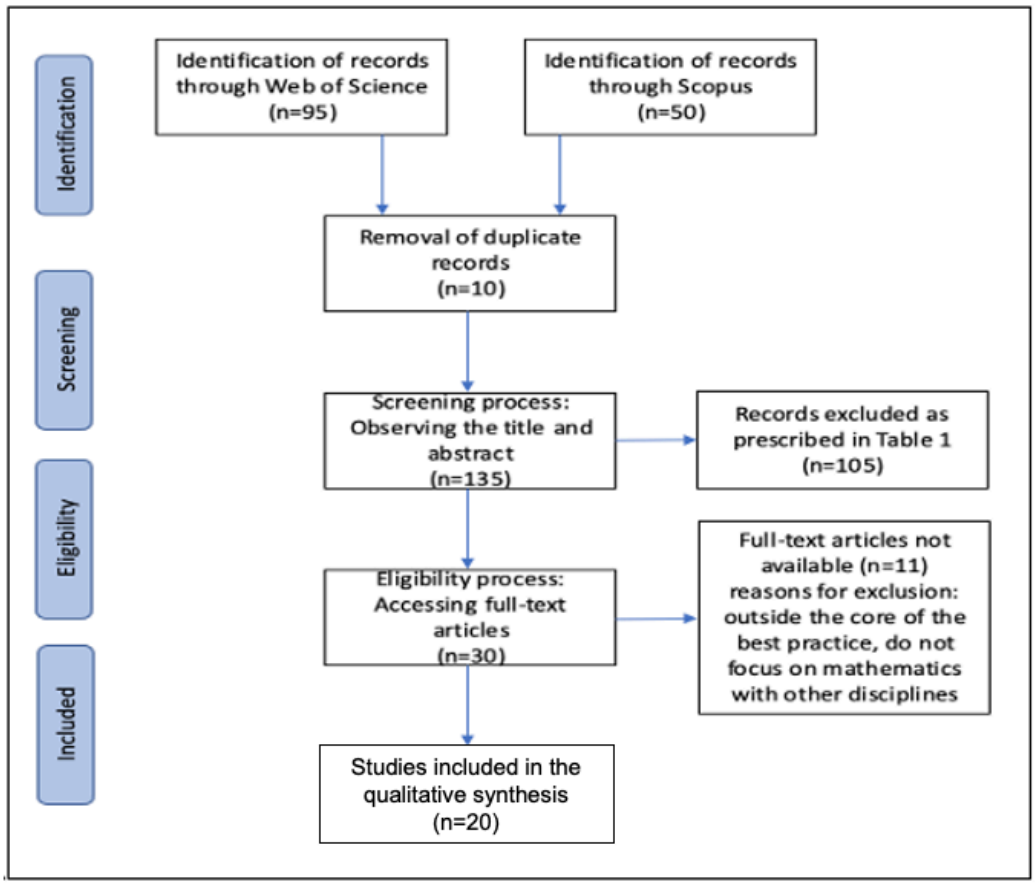


*Figure 1. Study Flow Diagram*

The researcher took into consideration and made some improvements to the 20 selected articles. Next, the researcher reached an agreement to determine the themes and subthemes based on Table 1. The variables were further identified based on the study of full (in-depth) articles.

*Table 2. Identified Articles for Further Analysis*

| No | Article Title | Authors | Journal |
|---|---|---|---|
| 1 | Digital Game and Mathematical Learning: Mathematic Quiz Shooting Game (MQSG) | (Muzakkir et al., 2021) | RITVET |
| 2 | Validity and Reliability of Form 1 Geometry Self-Learning Instrument | (Abdullah & Wei, 2017) | Malaysian Journal or Learning and Instruction |
| 3 | The Influence of Geogebra Application on Student Learning Outcomes on Transformational Geometry Materials | (Apriani & Hayati, 2022) | Jurnal Pendidikan Matematika & Sains |
| 4 | The Use of Multimedia-based Teaching Aids in Teaching and Learning in Benut Zone Secondary Schools | (Sallehin & Ab Halim, 2018) | TVET |
| 5 | Development of a Complete Set of ASK (Algebra Story Kit) Helps T&L process in Mathematics | (Ghani, 2019) | JTVE |
| 6 | Use of Display Light Board (DLB) to Improve Skills in Drawing Geometric Shapes in 'Still Life' | (Ladin & Mazan, 2021) | Jurnal Sains Insani |
| 7 | Development of 3D Maths Learning Application for Android Based 3-Dimensional Geometric Shapes Topic | (Salleh & Salleh, 2019) | Innovative teaching and learning journal |
| 8 | The Use of Algebra Tile Techniques in Mastering Algebraic Expression Multiplication Skills for Form 2 students | (Jubri et al., 2020) | Jurnal Dunia Pendidikan |
| 9 | The Development of Mathematical Achievement in Analytic Geometry of Grade-12 Students through GeoGebra Activities | (Khalil et al., 2018) | EURASIA Journal of Mathematics, Science and Technology Education |

*Table 2. Continued*

| No | Article Title | Authors | Journal |
|---|---|---|---|
| 10 | Game-Based Learning in STEM Education and 21st Century Skills Mastery | (Siong & Osman, 2018) | Journal of Social Sciences and Humanities |
| 11 | The Effectiveness of Using LOGO Programming on the Mathematical Achievement of Grade Two Students for the Geometry Topic | (Awang et al., 2016) | Jurnal Pendidikan Sains & Matematik Malaysia |
| 12 | Diagnosing Mastery of Skills and Errors of First Form Students for the Title of Geometry Construction | (Mat Yusof et al., 2019) | Journal of Social Science |
| 13 | Use of Teaching Aids for Primary School Mathematics Teachers (IR) | (Omar et al., 2017) | Jurnal Pendidikan Sains & Matematik Malaysia |
| 14 | Application of Constructivism Learning Theory in Mathematics Learning | (Voon & Amran, 2021) | Sains Insani |
| 15 | Performance Improvement through Understanding Teaching and Learning Systems towards Innovation and Best Practices | (Mohamad, 2019) | Journal of Teaching and Learning in Higher Education |
| 16 | Mathematics and 21st Century Skills: Student Perspectives | (Salehudin et al., 2015) | Jurnal Pendidikan Matematik |
| 17 | Role Playing Method in Basic Mathematics Teaching at Semporna Alternative Schools: A Case Study | (Taufik & Rosli, 2020) | Jurnal Dunia Pendidikan |
| 18 | Design Learning in Mathematics Education: Engaging Early Childhood Students in Geometrical Activities to Enhance Geometry and Spatial Reasoning | (Novita et al., 2018) | Journal of Physics |
| 19 | An Investigation of the Effects of Measuring Authentic Contexts on Geometry Learning Achievement | (Hwang et al., 2019) | Journals & Magazines |
| 20 | Development A Year One STEM Comic for Science and Mathematics Subjects | (Abdullah et al., 2018) | Jurnal Pendidikan Sains & Matematik |

## Findings

The findings in this section obtained through the systematic review process described above were divided into three: learning mathematics; and learning in the field of mathematics; and geometry and learning using teaching aids ensured in this study. Of the articles studied, eight articles noted on the use of teaching aids in teaching, six articles on the field and syllabus of geometry, and six other articles related to mathematics learning. Some findings of earlier investigations are supported by the results of this study.

The achievement of mathematics subjects in Malaysian public examinations such as PT3 and SPM shows a downward trend, as proven by the results of TIMSS. In the subject of mathematics, the field of measurement and geometry is challenging for students because it requires visualisation to solve related problems. As a result, diverse strategies, including the use of TAs, are needed for teaching, and learning mathematics. Based on past studies related to the use of TA in teaching Mathematics, it can improve students' High-Level Thinking Skills (HLTS). This approach provides positive effects on knowledge, understanding, skills, and student achievement in learning Mathematics, especially for students who are at moderate and weak levels. In addition, teachers agreed that the use of TAs would increase efficiency and professionalism as they feel more assured using the teaching tools n teaching effectively when teaching Mathematics.

However, based on the previous study, most TAs in measurement and geometry use computer-aided technology, and some TAs continue to be subpar. Thus, the suggestion for future study is to develop a TA that students can use directly in their mathematics class. The kit that will be developed is more practical and may be applied everywhere by various layers.

## Discussion

*Discussion of Learning Mathematics*

The effectiveness problem of mathematics learning among secondary school students receives attention from the Ministry of Education Malaysia, and the community of educators and educational researchers. Therefore, the understanding of concepts in mathematics learning is a key component of the learning process (Ahmad et al., 2018). As stated by Taufik and Rosli (2020), the role-playing method is a form of active teaching and learning suitable for the 21st century. The results of the study provided ideas to mathematics teachers to diversify activities during mathematics learning for more engaging and effective TL.

Mathematics is deemed a major subject from primary school to higher education in Malaysia. Learning mathematics demands students to understand a concept firmly and comprehensively (Voon & Amran, 2021). Thus, according to Voon, the Constructivism approach to teaching and learning mathematics could increase students' interest and attitude toward learning.

Mohamad's (2019) study also showed that the achievement of Mathematics and Science during UPSR and PT3 declined from 2014 to 2016. The findings of TIMSS 2015, TIMSS 2011, and TIMSS 2007 reflect the performance of students in the subject of mathematics, revealing that the level of basic knowledge of mathematics was still low compared to internationally set benchmarks (Mullis et al., 2012).

According to Ahmad et al. (2018), mathematics learning that emphasises memorising is a less structured method. 'Structured' means that the mathematical knowledge is arranged in an orderly and systematic manner. Students were unable to effectively connect the mathematically abstract world to the real world using this strategy. Therefore, teachers need to diversify the methods in the process of teaching and learning mathematics to uplift students' performance and meet the national educational aspirations (Mohamad, 2019).

Numerous complaints were often heard about the poor level of Mathematics proficiency among most students in the country (Zain, 2002). Therefore, mathematics educators need to lay an influential role in curbing the challenges of the 21st century. Selecting appropriate mathematics teaching and learning strategies could significantly maximise students' learning and pique their interest in the subject. Teachers are encouraged to adopt strategies that can actively engage students to formulate effective teaching and learning (Salehudin et al., 2015).

In conclusion, learning mathematics is very important in Malaysia. Since the level of basic mathematics knowledge is still low compared to the benchmarks set at the international level, teachers need to organize effective learning strategies such as diversifying learning and teaching patterns in the classroom to ensure the effectiveness of mathematics teaching.

*Discussion in the Fields of Measurement and Geometry*

The achievement of geometry in mathematics of primary school students in Malaysia is less satisfactory than that of primary school students in other Asia Pacific countries in the TIMSS, which involved Form Two (grade 8) students in 150 schools who were selected at random in 1999, 2003, 2007, and 2011 (Malaysia Education Development Plan 2013-2025). The TIMSS 2011 report showed a decrease in Malaysia's performance in terms of position for Mathematics subjects, which are 16 (1999), 10 (2003), 20 (2007), and 26 (2011), with a decrease in average marks of 79 points for Mathematics subjects from 519 (1999), 508 (2003), 474 (2007) to 440 (2011). The assessment of marks below 500 is considered a poor performance (Malaysia Education Development Plan 2013 -2025). Malaysia's unsatisfactory performance shows that these students are incapable of higher-level thought and reasoning at a higher level. Likewise, this situation applies to students of developed countries such as the US, China, Netherlands, and Singapore, which also showed low levels of achievement in geometry based on TIMSS 2007.

TIMSS 2015 revealed that Malaysia recorded an impressive improvement and was in the middle position among the 39 participating countries compared to TIMSS 2011. Based on the report, Malaysia managed to improve its position for Mathematics subjects in 22$^{nd}$ place with a score of 465 points, four places higher compared to TIMSS 2011 at 26$^{th}$ position (440 points). Malaysia is among the 18 countries that demonstrated a surge in achievement by 25 marks compared to TIMSS 2011.

Geometry learning is emphasised to students because twenty-four out of sixty mathematics topics in the secondary school mathematics curriculum contain aspects of geometry (MOE, 1998). An understanding of geometry can provide experiences to help students build an understanding of shape, space, and line, as well as their functions, respectively. It allows students to solve problems and apply them in their daily lives. In addition, Aysen Ozerem (2012) conducted a study to identify the weaknesses of high school students in Cyprus, Europe in the topic of geometry, namely angles and shapes, embodiment, and construction of geometry. The results of the study found that students had some topic misconceptions and poor basic knowledge. The degree to which students comprehend geometry depends on their active engagement in carefully crafted activities, class objectives, study atmosphere, and participation in conversation rather than memorisation, all of which contribute to progressive growth (Khalil et al., 2018).

Moreover, in Abdullah and Wei's (2017) study, geometry learning allows students to solve problems and apply them in real-world situations. Learning geometric concepts and mastering geometric problem-solving skills are important in mathematics education. Relating the environment to geometry will develop geometric knowledge and skills, spatial visualisation skills or spatial sense, as well as problem-solving abilities.

Additionally, a study conducted by Mat Yusof et al. (2019) identified that students did not fully comprehend angle constructions for the topic of form one's Geometry Construction. Students struggled with the construction of corners and were unable to label them correctly.

The study of geometry and spatial reasoning are essential subjects in mathematics learning. Besides, geometry and spatial thinking form the foundation for most mathematics instruction as well as other topics, particularly for pupils in early childhood education. However, because there aren't many activities that encourage kids to comprehend geometric occurrences in their environment, this feature is often disregarded (Novita et al., 2018).

In daily life, geometry knowledge is crucial. Numerous studies have demonstrated that by measuring real-world objects, students can enhance their grasp of geometric concepts as well as their geometry learning and level of achievement. Knowing geometry gives students the ability to explain the shapes of things like points, lines, curves, angles, parallels, circles, equal squares, or rectangles, all of which are extremely important in day-to-day living (Hwang et al., 2019).

Based on the study and the achievement of mathematics in Malaysia, it was found that most students have problems for topics under the field of measurement and geometry. This is due to the high level of visualization required for this topic. Additionally, this area of measurement and geometry is also important in everyday life. Therefore, the researcher wants to develop a TA that can help students in this field.

*Discussion of Learning Using Teaching Aids*

Game-based learning and training help encourage and motivate students to understand more rapidly and effectively, as well as educate pupils on good time management when answering questions (Muzakkir et al., 2021). In addition, based on a study conducted by Jasmi et al. (2011), teachers seemed more comfortable using two main types of teaching aids (TA)–handouts and modules, and textbooks–as well as four types of secondary TA, i.e., computers and LCD, plain paper, reference books, and pictures. These six types of TAs are frequently used by teachers from the 16 types of TAs listed by the researcher.

Sallehin and Ab Halim (2018) stated in her study that the explanation of a topic will be easier when using realistic videos and animations compared to merely providing a description. Teaching time can be saved, and the timeline of the syllabus can be adhered to accordingly. Teachers also agreed that using multimedia-based teaching aids would increase efficiency and professionalism as they feel assured using the teaching tools proficiently. Moreover, they recognised that when creating multimedia-based tools, the teaching and learning process became more engaging and creative. In addition, teachers must constantly improve their ICT knowledge and skills to keep up with the development of the ever-changing technology. Omar et al. (2017) concurred and stated that some teachers remain indifferent towards the use of multimedia-based TA in their R&D, considering that each teacher has diverse standpoints and values towards the practices done in TL. As such, some teachers who were still resistant to potential changes found themselves unprepared when using the teaching aids.

Subsequently, Ghani (2019) developed a complete set of ASK (Algebra Story Kit) as an aid in mathematics TL. According to the study, the ASK Set serves as a facilitator to help teachers, lecturers, students, and parents in presenting and easily comprehending the basic contents of Algebra. The result of a combination of five multimedia elements, namely text, graphics, audio, video, and Story Math's storytelling method can attract students to be engaged in the TL in the classroom and outside the classroom. Besides the content of ASK, which can be varied, TL activities could pique the interest and focus of students as well as increase their mastery of the basics of Algebra. As a result, more students may be inspired to participate in the ASK's question-and-answer sessions.

Jubri et al.'s (2020) study found that because the teaching methods are mundane, students are less motivated to learn mathematics, particularly when algebra is involved. Therefore, this study aimed at making a fun, interactive, and highly informative TL using the Algebra Tiles. The results of the study proved that the Algebra Tiles had huge potential in providing a positive effect on knowledge, understanding, skills, and student achievement in learning Mathematics, especially for students who are at moderate and weak levels.

Ladin and Mazan (2021) created an innovative tool called the Use of Display Light Board (DLB) to improve the technique of drawing geometric shapes. The lights are lit toward the geometric shapes placed on the board, resulting in light and shadow effects that guide students to draw the projected shapes. The results of using the DLB model showed that 100% of the students could straightforwardly observe and understand the direction of light as well as the shape of the shadow resulting from the light of the installed lamp. 90% of them could draw objects well by identifying the exact position of the shadow on the object. Thus, the study suggests that this DLB Model can be used by students to understand the concept of drawing objects accurately in a 'still life' with a clear light and shadow effect. The integration of game content aims to create a fun learning environment without neglecting the subjects that students must learn (Siong & Osman, 2018). Apriani and Hayati (2022) stated in their study that the learning outcomes of students using GeoGebra applications were better than those using conventional learning methods.

The needs of the 21st-century education system demand mathematics teachers shift from their traditional teaching methods to methods comprising creative and innovative elements. Therefore, an alternative that can be considered by Mathematics teachers is learning using teaching aids (Awang et al., 2016). Thus, this method can improve students' High-Level Thinking Skills (HLTS).

Omar et al. (2017) also demonstrated how important teaching aids are in helping teachers facilitate teaching and

learning. The study's conclusions showed that teaching tools had a significant positive impact on students in addition to teachers. STEM education, which is the integration of Science, Technology, Engineering, and Mathematics, is no longer foreign in today's world of education. Abdullah et al. (2018), conducted a study on the use of teaching aids known as STEM comics year one for science and mathematics subjects. The study found that this comic piqued the form one students' interest and improved their performance. Furthermore, teachers could utilise teaching aids to facilitate the teaching process.

Based on study, it was found that the use of TA helps in improving student performance and interest in various subjects. Therefore, teachers need to be creative and innovative especially in this modern era. The use of TA clearly helps students in understanding concepts. Therefore, the researcher plans to build a TA that can help students for mathematics subjects, especially in the field of measurement and geometry.

## Conclusion

Based on the articles studied, it was found that the use of TAs in the TL process positively influences student achievement and interest, especially in the field of measurement and geometry. Essentially, the use of teaching aids in the classroom is crucial to assisting students in developing their grasp of and interest in measurement and geometry. However, most TAs employed in measurement and geometry use computer-aided technology, and some TAs still lack effectiveness. Thus, the author intends to create a TA called the Transiso Kit, which can be used without internet or school computer lab access. The kit that the author aims to build is more practical and can be used anywhere by various layers.

## Recommendations

The recommendations for future researchers according to this topic are:

1) Researchers can explore other topics in the field of measurement and geometry to identify the effectiveness of the TA based on the achievement and interests of students.
2) Researchers can conduct research in the field of measurement and geometry by taking each level into account, including primary and secondary students.
3) Researchers can conduct the same research based on the education document guideline according to their own country.

## Limitations

The limitations of this study are:

1) Focusing only on the field of measurement and geometry for Form 2 students.
2) In this study, the review article was based on the Curriculum and Assessment Standard Document (DSKP) guide formulated by the Malaysian Ministry of Education.
3) The article does not cover all measurement and geometry topics but rather selects a few topics from previous research, such as Isometric Transformation and Polygon.

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### Authorship Contribution Statement

Shaharudin: Conceptualization and methodology, project administration. Shaimi: Writing—original draft preparation, Writing, review and editing. Adnan: Validation.

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