THE USE OF TEACHING AIDS FOR CIRCLE TOPICS AMONG SECONDARY SCHOOL TEACHERS

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ABSTRACT

Teaching aids assume a significant role in facilitating the instruction of the subject matter of Circles by secondary school educators. The subject of Circles encompasses the examination of angles and measurements, which are fundamental components of Mathematics. Despite the prior introduction of the concept of circles, numerous students still encounter challenges when attempting to solve mathematical problems related to this topic, even at the university level. The objective of this investigation was to explore how the incorporation of teaching aids can enhance the classroom milieu, particularly with regard to the topic of Circles. This quantitative study encompassed the participation of 350 mathematics teachers within secondary schools situated in the Kuantan district. The selection of participants was executed through purposive sampling. Data collected via questionnaires were subsequently subjected to analysis employing the Statistical Package from Social Science (SPSS), specifically version 29 of IBM. The findings demonstrate that teachers employ various forms of teaching aids, ranging from conventional methodologies to advanced computer software and interactive whiteboards. This study underscores the necessity of adopting a systematic and continuous approach, while also enhancing digital literacy and expanding technological access among teachers and students, thereby fostering an environment conducive to learning. Consequently, educators must possess extensive knowledge pertaining to digital resources to effectively impart comprehensive understanding to students about the topic of Circles.

Keywords: Teaching aids, Circle topic, secondary school teacher, knowledge, teaching

1. INTRODUCTION

Within the realm of education, instructional aids or educational materials are regarded as valuable assets that greatly contribute to the attainment of educational outcomes (Bakar & Sulaiman, 2021). These materials serve as instruments that enable educators to visually, audibly, or tactually elucidate concepts or ideas, thereby enhancing students' understanding. Instructional aids encompass a spectrum ranging from conventional tools such as business cards, charts, and posters to more advanced computer software, interactive whiteboards, and mobile applications.

In recent times, Malaysia's educational system has undergone significant reforms aimed at enhancing the quality of teaching and learning, particularly in the domain of mathematics (Malaysian Ministry of Education, 2020). As asserted by Bakar and Sulaiman (2021), the teaching
and learning of Circular topics in mathematics assumes paramount importance within secondary education, as this concept serves as a foundational pillar for students' comprehension of geometry. Additional investigation conducted by Reza and Mahmud (2021) demonstrates that students continue to engage with various challenges in mastering this subject matter.

Secondary school teachers encounter difficulties when it comes to comprehending the concept of the Circle. This includes grasping the Circle's properties and applying the corresponding theorem in problem-solving situations. Furthermore, the Circle topic also emphasizes the examination of area, perimeter, angle, and other intricate concepts that can prove to be challenging to teach without the aid of suitable teaching materials. Consequently, it becomes imperative to explore the utilization of teaching aids when instructing secondary school teachers on the topic of the Circle.

Within the realm of Mathematics education, a multitude of methods and approaches are employed to establish a strong foundation in the subject matter (Voon & Amran, 2021). This discipline, which encompasses numerous branches, holds significant importance in everyday life, ranging from basic calculations to complex computations in the domains of science, technology, and engineering. One such influential branch of Mathematics is the Circle, which serves as an integral component within the realm of geometry.

The instruction of the subject matter of Circles, as instructed at the secondary educational level, encompasses the computation of angles and other geometrical ideas connected to the Circle. It is a challenging subject to comprehend due to its intangible essence and intricate principles that are arduous to articulate. Consequently, in recent times, the progress and alteration of educational technology have persisted, revolutionizing the approach and application of teaching methods and techniques (Budiharto et al., 2019).

Today, numerous educators in secondary educational institutions integrate instructional tools into their instructional plans in order to enhance student learning and establish an engaging classroom atmosphere. A research conducted by Ismail, Zulkifli, and Mohamed (2022) demonstrates the significance of utilizing instructional aids in facilitating effective teaching and learning since these aids serve as valuable resources that offer supplementary information to students, thereby facilitating their learning process. These aids encompass a wide range of mediums, including visual aids such as charts and diagrams, as well as audio and tactile aids such as audio tapes and three-dimensional diagrams. The utilization of instructional aids in the classroom holds importance as it promotes active learning and sustains student participation throughout the learning process.

The utilization of instructional aids in the classroom represents an efficacious approach to fostering improved student learning and engagement. A study conducted by Wirysa (2023) unveiled that students exhibit heightened levels of motivation and cognitive retention when instructors employ instructional aids. The study identified that the utilization of visual aids such as posters, diagrams, and projectors assists students in comprehending concepts more effectively, which subsequently leads to enhanced examination outcomes. Similarly, a recent study conducted by Saifi et al. (2020) also ascertained that the utilization of instructional aids significantly augments student interest and academic performance.
One of the primary issues pertains to the selection and utilization of appropriate instructional aids. Frequently, instructors merely employ simplistic and standardized materials, which may not suffice in motivating students (Rosila & Wibowo, 2018). This often culminates in boredom or a lack of enthusiasm towards the learning of mathematics. Some instructors perceive the utilization of instructional aids as an additional burden on the teaching and learning process, as it necessitates extra time and resources.

Despite the merits and efficacy of instructional aids in mathematics education (Abd Samad et al., 2018), there still exist certain challenges in their effective utilization. One such challenge is the availability and accessibility of materials in numerous educational institutions. Insufficient funds may be allocated for the procurement of instructional aids, thereby restricting their availability in schools. Furthermore, inadequate teacher training on the utilization of instructional aids can impede their effective implementation in the classroom.

Hence, the objective of this study is to identify the impact of instructional aids, teacher training, budgetary constraints, and technological accessibility on the frequency and challenges associated with their utilization. The findings of this study will prove beneficial to policymakers, educators, and other stakeholders in formulating appropriate policies to promote the effective utilization of instructional aids in the instruction of Circle topics.

2. LITERATURE REVIEW

2.1. Knowledge of the principle for Teaching

The acquisition and facilitation process (PdPC) in the 21st century necessitate educators to enhance their existing knowledge to a level that aligns with the current educational demands (Costa et al., 2017). In order to teach effectively in the 21st century (PAK 21), secondary school teachers must possess knowledge and skills that go beyond traditional teaching methods. They must demonstrate proficiency in utilizing technology, implementing project-based learning, fostering collaboration, and promoting digital literacy. Additionally, 21st century teaching entails cultivating creativity and critical thinking skills among students, addressing diverse student needs, and fostering a positive classroom culture characterized by respect and discretion.

Content Pedagogy Knowledge (PPIK) is the principal knowledge that specialized teachers must possess for teaching a specific subject (McCoy, 2011). Teachers who possess a strong PPIK are considered more proficient in the subject matter compared to those who solely rely on Pedagogical Knowledge (PP). However, the understanding of PPIK remains insufficiently comprehended. With regard to this matter, Ball, Thames, and Phelps (2008) have expanded upon this category of knowledge, particularly in the context of mathematics teaching, by providing further clarification based on classroom activities related to PPIC.

Effective teaching necessitates a fusion of knowledge, skills, and strategies that enable teachers to establish a positive learning environment and support their students (Ab Hajis et al., 2022). Secondary school teachers need to possess an in-depth understanding of the subject matter, comprehend the developmental needs of their students, employ a variety of teaching strategies,
effectively manage their classrooms, integrate technology, assess student learning progress, and engage in ongoing professional development activities. These skills and strategies are indispensable in the teaching profession at the college level, as they can assist teachers in attaining their objectives and enhancing their teaching practices.

2.2. Model Mathematical Knowledge for Teaching

According to Nazilah (2021), Mathematical Knowledge for Teaching (PMP) constitutes a crucial element in the proficient instruction of mathematics. PMPs possess not only an understanding of mathematical concepts and problem-solving prowess, but also the capacity to convey these notions to students in an effective manner, encompassing appropriate instructional methodologies and recognizing prevalent misconceptions among students.

The formulation of the PMP was grounded in a well-elaborated model by Mulyana et al. (2014). PMP refers to the mathematical knowledge imperative for teachers to competently deliver mathematics instruction. It can be delineated into two constituents: Subject knowledge (PS) and pedagogical knowledge (PP). PS entails the comprehension of mathematical content that teachers must possess to effectively teach mathematics, while PP encompasses the knowledge of efficacious teaching strategies and methodologies in the context of mathematics instruction (Chen, Shafiihuna & Sher, 2021).

Proficient mathematics instruction necessitates both PS and PP. For instance, educators with extensive PS might encounter challenges in teaching the subject matter if they lack PP, whereas those with PP but deficient PS may struggle to articulate mathematical concepts effectively. In summary, PMP stands as an indispensable requirement for effective instruction, with educators necessitating both PS and PP in order to thrive.

2.3. Teacher's Knowledge in Using Teaching Aids

According to Heinrich et al. (2002), the utilization of instructional materials enhances the efficacy of a lesson and creates a multitude of interactive opportunities for students. Secondary school educators must possess knowledge regarding the utilization of instructional materials to convey content and facilitate intricate concepts for students.

A research study conducted by Zaharudin and Wah (2022) ascertained that instructional materials augment student engagement and foster active learning. Students are able to partake in the sharing and interaction of the material, thereby rendering the learning experience enjoyable and indelible. Moreover, instructional materials provide a visual overview of concepts and ideas, rendering them more comprehensible and memorable for students. In the context of group activities, these materials enable students to share ideas, collaborate, and appreciate the perspectives of their peers.

Bakri and Mahamood (2023), in their investigation, demonstrated that the utilization of instructional materials can establish a stimulating learning milieu, transforming the classroom into an interactive and visually captivating environment that engenders students' curiosity and imagination. Instructional materials manifest in a diverse array of forms, including digital, audio,
and visual resources, and they are both cost-effective and readily accessible. Consequently, they are within reach for all educators.

Educators should possess the acumen to select appropriate materials to ensure that instructional materials align with the objectives of the lesson and the learning needs of students (Bakri & Mahamood, 2023). They may also focus on providing materials such as slideshows or activity strands that support the lesson. Educators must be proficient in implementing teaching strategies that synergize with instructional materials. Efficacious pedagogical approaches encompass video presentations, group activities, problem-solving exercises, and interactive sessions involving students. Additionally, educators should ensure that instructional materials are in optimal condition and are provided prior to the commencement of class. The optimal utilization of instructional materials necessitates effective communication skills. Educators must communicate with students in a manner that ensures their comprehensive understanding of the content presented through instructional materials.

2.4. Types of Teaching Aids

The supplementary materials consist of videos, audio recordings, and multimedia presentations. These materials serve to elucidate concepts through practical applications and are particularly valuable in demonstrating diagrams or any other significant forms of idea representation (Zaharudin & Wah, 2022). Media materials encompass the overhead projector, slide projector, and LCD projector. These projected media effectively communicate information in a precise and succinct manner, thereby facilitating students' comprehension. Print media, such as posters, charts, and maps, aid in visually representing content and thereby contribute to a more thorough understanding of concepts.

Manipulative aids, which encompass blocks, models, and diagrams, allow students to effectively describe and comprehend abstract concepts. Computer-based instruction, which involves the utilization of software and online resources, offers interactive and enjoyable activities that foster deeper understanding and engagement among students (Lambri & Mahamood, 2019).

2.5. Circle Topic

Circular topics hold significant importance within the field of mathematics, particularly for high school students who frequently encounter challenges in comprehending these concepts. According to Shahiri's (2018) investigation, the utilization of instructional aids plays a crucial role in enhancing students' comprehension and command of this particular subject matter. Shahiri highlights the significance of employing instructional materials such as practice inquiries and interactive media to facilitate the understanding of circular concepts. Similarly, Abdul Razaq's (2019) study also identifies the difficulties faced by high school students in comprehending the topic of circles, which encompass challenges in accurately representing and delineating circles, calculating rotations, and grasping the interconnections between circles and other geometric shapes.
In an investigation conducted by Hasegawa et al. (2021), the obstacles confronted by high school students in effectively applying circular topics to real-world problems have been addressed. The outcomes of this study reveal that students encounter hurdles predominantly related to comprehending the practical application of circular concepts within real-life scenarios. Additionally, Shridhar et al.’s (2022) study delves into the misconceptions that secondary school students often harbor pertaining to the understanding of circular topics. In order to rectify these misconceptions, educators should diligently identify and address them by providing students with lucid and comprehensive elucidation, while embracing a diverse range of instructional aids and visual aids.

A comprehensive literature review underscores the potential of instructional aids in secondary schools to heighten student engagement, motivation, and learning outcomes. These supplementary materials encompass a wide array of formats, ranging from technological advancements to interactive whiteboards and narrative approaches. Their effectiveness, however, is contingent upon their harmonization with the curriculum as well as the learning objectives. Moreover, the seamless integration of these aids necessitates the availability of ample resources and ample practice on the part of the educator. The review also underscores the importance of selecting supplementary materials that optimally correspond to the subject matter or topic being taught.

3. RESEARCH METHODOLOGY

This investigation is a quantitative inquiry that employs questionnaires to acquire data when examining the assessment of the utilization of instructional materials for the Topic subjects amid educators in secondary schools. The selection of this particular sample is suitable for a sizable population due to the capacity to systematically interpret the consistency of facts and information from the respondents (Gay, Mills & AirAsian, 2006). The selection of the survey questions was based on the consideration of costs, which are not exorbitant, and the ability to implement them within a shorter time frame (Min & Pa, 2017). This enables the study to gain a comprehensive overview and a thorough understanding of the use of instructional materials for the subject of Roundabout among secondary school educators.

Table 1: Demographic Profile of Study Respondents

<table>
<thead>
<tr>
<th>Criteria</th>
<th>N</th>
<th>Percent %</th>
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<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>65</td>
<td>18.6</td>
</tr>
<tr>
<td>Female</td>
<td>285</td>
<td>81.4</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 30 years old</td>
<td>62</td>
<td>17.7</td>
</tr>
<tr>
<td>31-40 years old</td>
<td>175</td>
<td>50</td>
</tr>
<tr>
<td>41-50 years old</td>
<td>98</td>
<td>28</td>
</tr>
<tr>
<td>Above 50 years old</td>
<td>15</td>
<td>43</td>
</tr>
<tr>
<td><strong>Teaching Experience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5 years</td>
<td>46</td>
<td>13.1</td>
</tr>
<tr>
<td>5-10 years</td>
<td>133</td>
<td>38</td>
</tr>
</tbody>
</table>
The participants of the survey were comprised of 350 mathematics educators hailing from 10 secondary educational institutions within the quantum district. The selection of mathematics option teachers as survey respondents was made due to their expertise in the subject matter, which aids in comprehension, and their ability to provide clear and precise information based on their experience. Additionally, these individuals willingly participated in the study. The findings of the study indicated that 65 male teachers (18.6 percent) and 285 female teachers (81.4 percent) were involved in the research (see table 1).

The questionnaire employed in this research comprises four distinct sections. Part A entails gathering information about the respondents, such as their gender, age, teaching experience, as well as their educational background, as outlined by Mat Nor et al. (2018). Part B focuses on the various auxiliary materials utilized by mathematics teachers, with a selection of 12 different types of materials being chosen for the study. Part C aims to evaluate teachers’ perspectives regarding the use of instructional aids, utilizing a 5-point Likert scale consisting of responses ranging from 1= strongly disagree (SD) to 5= strongly agree (SA). This section explores 15 specific items. Meanwhile, Part D sheds light on the challenges and limitations faced by teachers in utilizing instructional aids. Respondents were asked to answer either "Yes" or "No" in response to 10 given items.

### Table 2: Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of items</th>
</tr>
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<tbody>
<tr>
<td>.952</td>
<td>15</td>
</tr>
</tbody>
</table>

In the realm of cultural and contextual circumstances, it is imperative to evaluate the relevance and appropriateness of survey inquiries. Concerning reliability, Cronbach's Alpha serves as a frequently employed metric to gauge the internal consistency between items within the research question posited by Isaac et al. (2019). A heightened score on Cronbach's Alpha (in closer proximity to 1) signifies enhanced trustworthiness. The accrued data has been documented as per the descriptive analysis research question, which has been undertaken to acquire an encompassing depiction of the sample distribution within the study.

Before executing the process of data collection, numerous ethical measures have been implemented to expedite the study process. Veracity from the Department of Design and Research of Basic Education (EPRD) represents the primary measure in this undertaking, ensuring adherence to regulations and guidelines established by central authorities. Furthermore, truthfulness from the Pahang Negeri Pahang Department (JPNP) and the Kuantan Regional Education Office (PPD) was also secured to obtain consent for conducting the study. Additionally, the veracity and permission from the school were obtained to facilitate this investigation.
Following the acquisition of veracity, the questionnaire is disseminated via the WhatsApp application in the form of a GoogleForm, to be completed by mathematics teachers.

The process of data analysis, employing SPSS version 29, encompasses descriptive statistical analysis.

4. FINDINGS

The significant gender differences are evident in the demographic profile of respondents, as presented in Table 2. The data reveals that female respondents overwhelmingly dominate the sample, accounting for 81.4% of the participants, compared to a mere 18.6% for male respondents.

The majority of participants, comprising 50% of the total number, fall within the age group of 31-40 years. This indicates that a considerable proportion of teachers in this study are relatively young, likely in the middle of their careers, and possibly more attuned to current educational trends and methodologies, including the integration of technology in teaching.

The compilation of various teaching experiences among respondents provides a comprehensive overview of the teaching landscape. The largest segment of respondents, constituting 38% of the total, has 5-10 years of experience. The second highest group, comprising 32.3%, consists of individuals with 11-20 years of experience who are proficient in their field of work and adept at utilizing appropriate and relevant supplementary materials in the Monthly Topics. Although the smallest at 16.6%, those with over 20 years of experience offer a valuable long-term perspective on changes in mathematics education, including a transition from traditional teaching aids to more technologically advanced methods.

![Figure 1: Percentage Use of Teaching Aids by Study Respondents](image)

The utilization of whiteboards, blackboards, and multimedia emerges as the most commonly employed supplementary resources, surpassing all other materials with a utilization rate of 100%, which amounts to a total of 350 individuals. Noteworthy discrepancies were observed in the usage
of other materials, such as models, games, and audio, within this study. Specifically, models and games were notably lower, accounting for 14.6% (51 individuals) and 12.0% (42 individuals) respectively, while audio was utilized by 42.0% of the 147 participants. The employment of games displayed a somewhat low utilization rate of 12.0%. Textbooks, on the other hand, were embraced by 91.1% of the respondents, remaining as an emblem of education by serving as the principal source of information and structured knowledge.

The inclusion of mind maps (55.1%) and educational videos (67.1%) in the teaching process manifests a trend towards pedagogical approaches that foster creativity and engagement. The preference for posters, expressed by 51.1% of the participants, underscores a reliance on visual materials to enrich the learning experience. Imbasan cards, employed by 50.3% of the participants, represent a traditional pedagogical tool. The rather heightened utilization rate of projectors, at 66.3%, underscores the significance of digital offerings in contemporary classrooms. This investigation elucidates that over 50% of the respondents employ these materials.

The data presented herein divulge a vast and varied spectrum of teaching aids, ranging from conventional instruments such as textbooks and flashcards to contemporary digital aids such as projectors and educational videos. This diversity exemplifies the educators' employment of an amalgamation of approaches to cater to distinct learning styles and augment the effectiveness and appeal of their teaching methodologies.

4.1. Constraints and Challenges in the Use of Teaching Aids

Various constraints and challenges encountered by educators when utilizing instructional materials for the Circle topic in mathematics are evident. These challenges encompass a wide range, from personal comfort and the availability of resources to factors related to the institution and students.

<table>
<thead>
<tr>
<th>Constraints / Challenges</th>
<th>Yes</th>
<th>No</th>
</tr>
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<tbody>
<tr>
<td>Comfortable using teaching aids</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>The lack of teaching aids in schools is a major challenge</td>
<td>76</td>
<td>24</td>
</tr>
<tr>
<td>Additional expenses for the purchase of teaching aids become a</td>
<td>82.3</td>
<td>17.2</td>
</tr>
<tr>
<td>barrier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limiting the use of technology is a challenge</td>
<td>75.7</td>
<td>24.3</td>
</tr>
<tr>
<td>Lack of training and sufficient time to prepare materials</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Lack of creativity in making materials</td>
<td>63.4</td>
<td>36.6</td>
</tr>
<tr>
<td>Inappropriate classroom situations</td>
<td>63.7</td>
<td>36.3</td>
</tr>
<tr>
<td>Go through many hurdles and procedures to get consent</td>
<td>42.6</td>
<td>57.4</td>
</tr>
<tr>
<td>Considered unimportant by the admin and admin panel</td>
<td>36.3</td>
<td>63.7</td>
</tr>
<tr>
<td>Students usually do not appreciate or have a negative perception</td>
<td>72.6</td>
<td>27.4</td>
</tr>
</tbody>
</table>
The findings of the study reveal that 60% of teachers express a level of comfort in utilizing teaching aids for instructional purposes, while a notable 40% do not. Bureaucratic challenges are also prevalent, with 42.6% of teachers reporting barriers and procedures in obtaining school approval to incorporate teaching aids. Although not a majority, a significant percentage of 76% of teachers consider the scarcity of teaching aids in schools as a major hurdle. Furthermore, 82.3% of teachers perceive the additional expense associated with purchasing teaching aids as a barrier. This substantial percentage underscores the significant role that financial constraints play in the availability and utilization of teaching aids. Additionally, 75.7% of teachers identify limitations in technology as a notable challenge, although a total of 24.3% do not concur. The absence of creativity in developing teaching aids can also pose as a barrier, which is observed by 63.4% of teachers. Furthermore, inappropriate conditions within the classroom environment can impede the effective use of teaching aids, as identified by 63.7% of teachers.

5. DISCUSSION

In the current era, characterized by the 21st century, the field of education has experienced a rapid expansion in both technological advancements and pedagogical approaches. According to Chen, Shafilhuna, and Shir (2021), the utilization of instructional aids in the context of Round topics has proven to be an efficacious method, capable of leaving a positive impact on learners. For educators and didactic experts alike, possessing a comprehensive understanding of the diverse range of instructional aids that can be implemented within the classroom environment represents a crucial facet in enhancing the quality of the teaching and learning process. It is within this framework that we can observe the amalgamation of classical and contemporary approaches, which engenders a more effective and meaningful instructional atmosphere.

Classical methods, as delineated by Olabisi and Adedokun (2021), such as the utilization of textbooks and blackboards, have enjoyed a longstanding presence within the realm of education. The textbook, renowned for its wealth of knowledge and structured content, furnishes students with a solid foundation in the realm of Roundness. It imparts information in a systematic and sequential manner, thereby facilitating teachers in effectively disseminating the content of their lessons. Alternatively, whiteboards offer educators a degree of flexibility in spontaneously presenting information, thereby affording a two-way interaction with students and facilitating the visual illustration of concepts or ideas. Furthermore, teachers do not solely rely on textbooks as their primary teaching tool, as they prioritize experiential learning. Khamaruddin, Khairuddin, and Mansor (2022) contend that the incorporation of pertinent, engaging, and easily accessible instructional resources aids students in comprehending and focusing their attention on the subject matter being taught in the classroom.

Nevertheless, owing to the progress of technology, education has undergone a transformation, wherein contemporary methods such as multimedia and interactive whiteboards have become integral components (Al-Turiman & Faris, 2019). Multimedia, with its ability to convey information through text, graphics, audio, and visual elements, offers a dynamic and interactive platform for instructional purposes.
Videos and other multimedia resources offer an enhanced learning experience, providing students with a deeper understanding of concepts through visualization and simulation. In contrast, interactive whiteboards take interactivity to a new level, fostering collaboration between teachers and learners in real-time teaching and learning settings. Yurniawati and Soleh (2019) assert that teachers' confidence in their pedagogical content knowledge is crucial, highlighting the importance of adapting teaching aids to enhance self-assurance in instructional practices.

Moreover, the significance of incorporating teaching aids across all classes is underscored, emphasizing the preference for interactive and engaging teaching methods over traditional lecture-based approaches. Teachers recognize the positive impact of consistent use of teaching aids on student achievement, as it strengthens learning and understanding. According to Uno and Mohamad (2022), teaching aids are viewed as tools that facilitate teaching tasks, enabling the effective communication and validation of concepts and problem-solving. This not only streamlines the teaching process but also enhances the overall quality of education. Furthermore, the motivational aspect of teaching aids is noteworthy, as many teachers acknowledge their ability to generate greater interest among students, particularly in subjects like mathematics.

The use of teaching aids in teaching circular topics in mathematics presents a comprehensive overview of the challenges faced by educators in the teaching and learning process. Banilower et al. (2018) confirm that some teachers may be reluctant to teach these topics due to difficulties in understanding them. The willingness of teachers to engage in teaching has a significant impact on instructional delivery (Kamry & Hamry Zah, 2019). Additionally, the lack of creativity in developing teaching aids is a concern, as educators require access to innovative approaches and resources to create effective and engaging materials. Enhancing creativity in teaching aids goes beyond making lessons more interesting; it involves catering to diverse learning styles and adapting to evolving educational trends.

The use of teaching aids that provide an interactive and engaging learning experience, such as 3D models (supported by Wahid and Samah, 2019), manipulative tools, and visually and auditorily prominent elements (acknowledged by Zaharuddin and Wah, 2022), can significantly enhance the learning experience. Similar advantages can be observed in the use of animations in mobile applications. When appropriately integrated, these elements serve as motivational tools, igniting students' interest in circular topics in mathematics.

The achievement of expertise in mathematics is heavily reliant on the creation of formulas and concepts using suitable and pertinent instructional materials (Bakri & Mahamood, 2023). Consequently, the selection of appropriate instructional materials, which facilitate the clarification and reinforcement of comprehension regarding concepts and formulas pertaining to the Circle, holds great significance within mathematics education. Appropriately chosen supplementary tools can dissect this intricate formula into more comprehensible segments. The outcomes of the investigation conducted by Libau and Ling (2020) succinctly summarize that the utilization of appropriate instructional materials enhances the learning environment.
6. CONCLUSION

This investigation has revealed the significant potential of utilizing instructional resources to enhance the educational process of Mathematics, specifically in the area of Circles at the secondary school level. The primary focus pertains to educational materials that can facilitate the comprehension and mastery of mathematical concepts, particularly within the context of the Circle topic, which offers students the opportunity to engage in a more comprehensive and meaningful learning experience. These materials not only serve as tools to aid students in understanding mathematical terminology and concepts, but also act as a catalyst for enhancing students' verbal communication skills. Consequently, students are able to express and apply these concepts in practical contexts and real-life applications. However, the successful integration of these instructional resources is contingent upon not only the effectiveness of the material itself, but also the support and proficiency provided to teachers, students, and school administration in incorporating them into the educational process. The provision of high-quality feedback should be prioritized in order to enhance the caliber of student learning. Therefore, the cultivation of digital literacy skills and the provision of technological resources emerge as critical components that necessitate attention in order to optimize the utilization of instructional resources in the teaching of Mathematics.

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