

## Calistung-Based Smart Book Media to Increase Student Interest in Learning Mathematics

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### ABSTRACT

Low learning interest among Hulu Langat Guidance Studio students has been observed, prompting efforts to enhance engagement through innovative methods. This study investigates the effectiveness of *Smart Book* media in increasing students' interest in learning. Employing a classroom action research approach, the study followed four stages: planning, implementation, observation, and reflection. Conducted at the Hulu Langat Guidance Studio in Malaysia, the study involved a sample of 10 students. Data were collected through observation and questionnaires over two research cycles, incorporating *Smart Book* media. The findings revealed a significant improvement in students' learning interest following the implementation of *Smart Book* media. Questionnaire results indicated that all students categorized their learning interest as "Very Interested" after using *Smart Book* media. The results demonstrate that *Smart Book* media effectively enhances student engagement by making the learning process more interactive and appealing. *Smart Book* media is a valuable tool for increasing students' interest in learning, as evidenced by the positive outcomes of this study. Further research with larger samples and diverse contexts is recommended to validate these findings and explore broader applications of *Smart Book* media.

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## 1. INTRODUCTION

Improving community welfare through education is one of the government's key strategies to address societal challenges and prepare for a better future. Education serves as a foundation for shaping the youth, who play a pivotal role in building and sustaining progress. Communities contribute to this effort by fostering the development of skills, knowledge, and values both within and beyond formal schooling (Utami, 2020).

Schools are central to this mission, serving as environments where students acquire expertise, knowledge, and practical skills. Among the core subjects taught, mathematics stands out as a critical discipline that equips students with the tools to think logically, solve problems, and navigate real-world

challenges. However, mathematics, being an abstract science, is often perceived as difficult, intimidating, and monotonous, deterring many students from engaging with it enthusiastically (Nisa et al., 2021).

Recognizing the indispensable role of mathematics, Ikhsan (2019) highlights its relevance to daily life, emphasizing that learning mathematics is integral to understanding and addressing practical issues. Similarly, Rachmantika and Wardono (2019) argue that mathematics fosters logical, critical, creative, and diligent thinking, shaping students' character and preparing them to tackle diverse challenges. Given its importance, innovative and engaging teaching methods, such as *Calistung*-Based Smart Book Media, are essential to increase student interest and active participation in mathematics learning, ultimately bridging the gap between theoretical knowledge and its practical applications.

The learning process really needs to be considered, including the selection of learning models, methods used, and the right learning media (Sumaji & Wahyudi, 2020). The success of students in learning mathematics has many factors, both internal factors and external factors. The internal aspect is in the form of attitudes, talents, interests, intelligence, and self-motivation, while the external aspect can be from the outside environment, such as teachers, family, and peers. External factors such as teachers have a role in managing teaching and learning activities, to explore the learning potential of students in achieving learning success. (Raharjo et al., 2021)

Interest is attraction without cause (Khairial et al., 2022). Based on the understanding of interest that has been quoted, the interest in learning in the world of education is a situation where students have an interest in learning. Interest in learning has a relationship with the success of student learning because interest in learning has indicators that can support the success of student learning, thus causing encouragement or desire for teaching and learning activities (Yolanda & Meilana, 2021; Khairial et al., 2022). There is a relationship between interest in learning and the achievement of teaching and learning activities. Teachers have a role in maintaining the interest in learning students (Lazarides et al., 2019). The role of teachers is to maintain students' interest in learning through innovative and varied learning activities, adequate learning facilities, and the use of learning media (Sobron et al., 2021). The use of learning media can overcome the low interest in learning students who are influenced by the many types of *games* and TV shows that divert students from books (Charli et al., 2019). Sukiman (Farihah, 2021). One tool used to convey information or messages to others with the aim of arousing thoughts, feelings, and interest in learning so as to achieve learning objectives is learning media. Through the media, the delivery of information or messages can be conveyed easily and precisely (Siregar et al., 2023). The characteristics of learning media are practical, critical, effective, and varied (Dwijayani, 2019).

Learning *baca*, *tulis*, and *hitung* (*calistung*) is part of learning mathematics which is one of the beginnings of the basic learning process (R. P. Kurniawati, 2021). The selection of learning media for basic education needs to be considered by the character and development of the times. Selection of *calistung*-based learning media (to increase interest in learning, it is necessary to meet the indicators of interest in learning. Indicators of interest in learning are interest, pleasure, attention, and involvement (Yunitasari & Hanifah, 2020). Fulfillment of learning interest indicators can increase students' interest in learning.

Malaysia is a country that has quite a lot of Indonesian migrant workers (Fikri, 2022). The large number of migrant workers resulted in the birth of more than 50,000 Indonesian children which then became a new problem in relations between Indonesia and Malaysia (A. B. Wulandari et al., 2022). The problem is in the form of children's limited actions by Indonesian migrant workers (PMI) To obtain education, this is one of the problems in the world of Indonesian education in Malaysia (Udhwalalita & Hakim, 2023). Limited access to education for migrant workers is a problem of children's interest in learning being low or even losing the desire to study further. With this problem, researchers design interesting and fun learning media (Yeh et al., 2019) based on *calistung*.

Basic mathematics serves as a foundational discipline in education, enabling the study of other fields such as science and technology (D. Kurniawati & Ekayanti, 2020). Researchers emphasize the importance of effective learning media in basic mathematics to create a stimulating and enjoyable learning environment that enhances student engagement and outcomes (Setyowahyudi et al., 2021). The selection of SMART BOOK media is particularly appropriate for achieving these goals. Designed

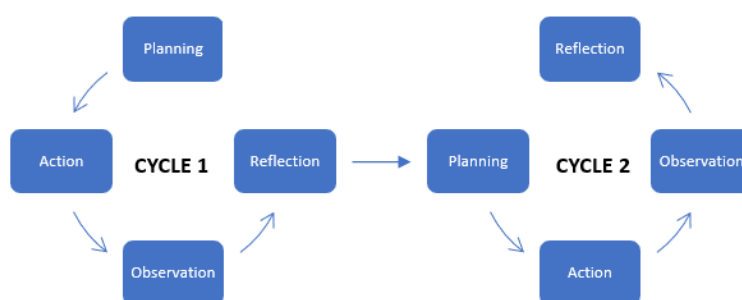
for children aged 6-7 years, this *calistung*-based (reading, writing, and arithmetic) media provides an innovative approach to learning foundational mathematics.

This study addresses the gap in designing and implementing learning media tailored specifically for early mathematics education. While prior research has demonstrated the effectiveness of media such as Busy Book (Noviana et al., 2023), Powtoon (Fadilah et al., 2022), and Google Forms (Ardiansyah, 2020) in improving student engagement and learning outcomes, limited attention has been given to media that integrate interactive methods with cultural relevance. The novelty of *Smart Book* lies in its combination of tactile activities such as tracing dots, games involving object counting, and subtraction through cross-out techniques, and animations that introduce aspects of Indonesian culture.

The aim of this research is to develop and evaluate the *Smart Book* as a tool to enhance students' interest in learning basic mathematics. Its significance lies in its potential to provide an engaging and culturally enriching learning experience while promoting essential literacy and numeracy skills. By addressing both the cognitive and motor skill development of young learners, *Smart Book* serves as a valuable contribution to early education practices.

## 2. METHODS

This study is a classroom action research. The class action method is carried out directly in the field or class as an option to improve the quality of learning activities (Safangati & Suhendar, 2020). The purpose of this study is to increase students' interest in learning through *Smart Book* media. The problems encountered in the field became the beginning of the research, which consisted of repeated actions (Subiyakto et al., 2020). This research was conducted on grade 1 students of SB Hulu Langat, located in Selangor, Malaysia in February 2023. The classroom action research procedure goes through stages, namely, the planning stage to plan learning activities using *SMART BOOK* media to be carried out in class, the implementation stage is the stage of carrying out activities using the planned *SMART BOOK* media, the observation stage to see the results of implementation using *SMART BOOK* media after learning takes place, and the reflection stage is to see the feedback response from the use of *SMART* media *BOOK*. The following is a scheme of classroom action research design according to Stephen Kemmis and Robyn McTaggart :



**Figure 1.** Scheme of Classroom Action Research Design by Stephen Kemmis and Robyn McTaggart

In cycle 1 of the planning stage, researchers prepare and make learning tools such as: syllabus, learning implementation plans (RPP), learning media and assessment instruments, which will be used in the learning process. After preparing all learning tools at the planning stage, the next stage, namely action, at this stage, researchers introduce the "*Smart Book*" media to students before being used in the learning process. Media introduction activities are carried out by showing the media and the parts and functions of the "*Smart Book*" media which will later be used by students. After that, at the observation stage, researchers observed students' interest in the "*Smart Book*" media, which was introduced through the enthusiasm of students when observing the media. At the reflection stage, researchers conducted

questions and answers to students about their interest and understanding of the "Smart Book" media that had been introduced.

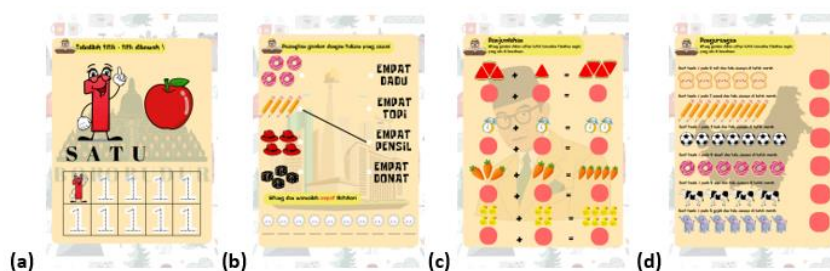
In cycle 2, during the planning stage, researchers prepared the learning tools and media developed in cycle 1 for implementation in classroom activities. At the action stage, the use of SMART BOOK was introduced to students to facilitate the learning process. During the observation stage, researchers closely monitored students' engagement and interaction with the *Smart Book* during classroom activities. In the reflection stage, questionnaires were distributed to gather student feedback and suggestions regarding the use of *Smart Book*. The reflection findings were then analyzed to assess the effectiveness of the *Smart Book* and refine its use in subsequent learning activities.

The *Smart Book* was designed to assist students in mastering basic literacy and numeracy skills, including reading, writing, and arithmetic. It incorporates tracing exercises and addition and subtraction operations, accompanied by vibrant color visuals to capture and sustain students' interest. This combination of interactive and visually engaging features made the *Smart Book* an effective tool for enhancing student motivation and participation in learning activities.

The instrument used in data collection is a questionnaire of student learning interest. Researchers provide questionnaires of learning interest to students regarding learning interests after using "Smart Book" media. The questionnaire used is in the form of a statement sheet. Data collection techniques in this study used observation, questionnaires, and documentation while in the field. Observation is carried out to see, and observe the situation directly when learning takes place during the use of media (Mashuri et al., 2019). At the observation stage, researchers observe and record students directly in the field about the state of the learning process when using "Smart Book" media. Questionnaires are used to obtain responses related to the results of media use (Fahmi & SS, 2019). The questionnaire contains 20 questions containing 10 positive statements and 10 negative statements, this statement contains the perspective of students in learning using the media "Smart Book". The questionnaire refers to the indicators of student learning interest adapted from (Yunitasari & Hanifah, 2020).

Data analysis techniques in this study use quantitative descriptive analysis, research that describes, examines and explains a phenomenon with data (numbers) as it is without intending to test a particular hypothesis (Wahyudi, 2022). The function of quantitative descriptive analysis is to determine the usefulness of the media (Kehnia & Darwis, 2021) "Smart Book" on the interests of learning participants in SB Hulu Langat.

The implementation of the research was carried out face-to-face with meetings four times, twice in cycle 1 and twice in cycle 2. The time used for each meeting is 30 minutes. In this study, *Smart Book* media was used containing *Tracing*, and addition and subtraction calculation operations with colorful visuals.



**Figure 2.** *Smart Book* Media Used in Cycle 1 and Cycle 2, (a) tracing the dots design, (b) object matching design, (c) addition operation design, and (d) subtraction operation design

The questionnaire contains 20 questions related to the mathematics learning process. The category of learning interest can be seen from the determination of data classification in the questionnaire results into 4 groups. The questionnaire category uses the Likert scale to measure responses in the form of individual attitudes and opinions (Taluke et al., 2019) with interest levels, namely Very Interest (SM),

Interest (M), Lack of Interest (KM), No of Interest (TM). The category of learning interest scale can be obtained from the following formula :

$$\text{Interval Scale} = \frac{\text{Maximum value} - \text{Minimum Value}}{4}$$

Hereby obtained,

$$\text{Interval Scale} = \frac{80 - 20}{4} = \frac{60}{4} = 15$$

Based on this formula, The scores obtained by students are notated with ( $N$ ) then classified into the classification of learning interests is presented in **Table 1**.

**Table 1.** Classification of Student Learning Interests

Classification	Interval
Very Interested	$65 \leq N \leq 80$
Interest	$50 \leq N \leq 64$
Lack of Interest	$35 \leq N \leq 49$
No of Interest	$20 \leq N \leq 34$

The classification of student learning interest will be processed into a frequency distribution of student learning interest after going through the classroom action research (PTK) process, the results of the frequency distribution will show indicators of student interest success. The success indicator of this success is that all learners have an interest in the "Very Interest" category or score  $N \geq 65$

### 3. FINDINGS AND DISCUSSION

#### 3.1 Findings

The increase in the percentage of student interest in learning is seen through the results of pre-cycle, cycle 1, and cycle 2 presentations. The quantitatively analyzed data are shown in **Table 2**.

**Table 2.** Increased Learning Interest of Pre-Cycle to Cycle 1 Students

Subject	Pra - Cycle		Cycle 1	
	Score	Category	Score	Category
1.	36	Lack of Interest	54	Interest
2.	22	No of Interest	49	Lack of Interest
3.	30	No of Interest	50	Interest
4.	31	No of Interest	53	Interest
5.	26	No of Interest	52	Interest
6.	34	No of Interest	52	Interest
7.	31	No of Interest	52	Interest
8.	23	No of Interest	48	Lack of Interest
9.	24	No of Interest	52	Interest
10.	31	No of Interest	52	Interest
Average	28.8	No of Interest	514	Interest

Observations at SB Hulu Langat revealed that Grade 1 students generally exhibit low interest in learning. This lack of engagement stems from the minimal use of interactive media, leading to monotonous teaching methods that cause students to lose focus and become easily bored. During the pre-cycle phase, student interest in learning was measured at a low average score of 28.8.

In cycle 1, the first meeting introduced mathematics learning with the *Smart Book* media. Initially, many students appeared unfamiliar with this new learning tool. However, by the second meeting, students began to show enthusiasm for the *Smart Book*, as evidenced by their active participation and

heightened interest during lessons. To evaluate the impact of the media, researchers administered questionnaires at the end of each meeting to assess changes in student interest.

The results of cycle 1, as shown in Table 2, indicated that while student engagement improved, it still fell short of the success indicators. These findings highlighted the need for further refinements, which were addressed in cycle 2 to better meet the desired outcomes and sustain student enthusiasm in learning activities.

**Table 3.** Increased Interest in Learning Students Cycle 1 to Cycle 2

Subject	Cycle 1		Cycle 2	
	Score	Category	Score	Category
1.	54	Interest	69	Very Interest
2.	49	Lack of Interest	65	Very Interest
3.	50	Interest	67	Very Interest
4.	53	Interest	68	Very Interest
5.	52	Interest	67	Very Interest
6.	52	Interest	66	Very Interest
7.	52	Interest	67	Very Interest
8.	48	Lack of Interest	66	Very Interest
9.	52	Interest	67	Very Interest
10.	52	Interest	67	Very Interest
Average	51.4	Interest	66.9	Very Interest

In the first meeting in the second cycle, the enthusiasm of students continued, along with their interest and pleasure, when researchers showed the *Smart Book* media. In this last meeting, which was the second meeting in cycle 2, was enthusiastic about the involvement of students in using *Smart Book* media, this last meeting researchers gave a questionnaire to see an increase in interest in learning. Due to the low interest in learning at the beginning of learning, researchers used *Smart Book* media within four meetings. The results showed an increase in student interest in learning in cycle 1 and cycle 2. Referring to cycle 1, students who have not reached the research success indicator experience an increase in score in cycle 2, and the overall student score  $M \geq 65$ , where the learning interest classification has been categorized as "Very Interest", so there is no need to continue to cycle 3

Based on observations of the situation there, researchers found that grade 1 students of SB Hulu Langat mostly had low interest. The low interest is caused by the lack of use of media so that learning still uses monotonous methods, resulting in children getting bored easily. The use of "*Smart Book*" media is expected to increase students' interest in *calistung*. After the use of "*Smart Book*" media in cycle 1 shows student enthusiasm but students still do not meet the success indicators. Then in Cycle 2 the enthusiasm of students continues with interest, fun and involvement in learning. So that the results of using *SMART BOOK* media show an increase in student interest in learning in cycle 1 and cycle 2 which at the same time increases students' *calistung* ability.

### 3.2 Discussion

The findings from Cycle 1 demonstrate that the use of *Smart Book* media positively influenced students' interest in learning during classroom activities, as evidenced by data collected through questionnaires and documentation. Although students initially felt unfamiliar with the media, consistent exposure during each 30-minute learning session helped them adapt. The *Smart Book* media was utilized to teach basic *calistung* (reading, writing, and arithmetic) skills, gradually engaging students in the learning process.

Cycle 1 showed an average increase in student interest, with scores improving by 22.6 points from the pre-cycle baseline. This improvement aligns with the indicators of student interest in learning outlined by Slamet (Dewi & Rohmalina, 2023), which include interest, feelings of pleasure, attention,

and involvement. Among these indicators, the sequence of success in Cycle 1 was observed as interest, pleasure, involvement, and attention.

Student interest in learning, as defined by Nurhana and Winata (2019), reflects an individual's willingness and motivation to engage in educational activities. This growing interest serves as a foundational step toward fostering a deeper desire for continued learning, indicating the potential of *Smart Book* media to sustain and enhance students' long-term engagement and enthusiasm for education.

The findings from Cycle 2 indicate that the use of *Smart Book* media significantly enhanced students' interest in learning during classroom activities, as confirmed by data from questionnaires and documentation. Researchers observed a notable increase in students' enthusiasm and active participation when using *Smart Book* media. During the sessions, researchers introduced numbers through relatable objects depicted in the *Smart Book* media, such as an image of a single apple to represent "one." This approach enabled students to recognize and trace numbers confidently without hesitation.

In addition to number recognition, the *Smart Book* facilitated learning arithmetic operations. For addition, researchers used object-based stimuli to simplify calculations, while subtraction exercises involved crossing out objects, making the operations intuitive and engaging for students. The interactive and visually appealing features of the *Smart Book* kept students engrossed, with the 30-minute learning sessions feeling notably short due to their heightened enthusiasm.

By the end of Cycle 2, the *Smart Book* media met the established indicators of student interest in learning, including feelings of happiness during lessons, active participation, increased attention, and engagement with the material. The integration of colorful visuals and *calistung*-focused exercises further amplified students' motivation and enjoyment. The average score improvement from Cycle 1 to Cycle 2 was 15.5 points, while the overall increase from pre-cycle to Cycle 2 was 38.1 points, demonstrating the effectiveness of *Smart Book* media in fostering sustained interest and engagement in learning activities.

**Table 4.** Frequency Distribution of Student Learning Interest

Classification	Interval ( <i>M</i> )	Frequency	Presented
Very Interested	$65 \leq M \leq 80$	10	100 %
Interest	$50 \leq M \leq 64$	0	0 %
Lack of Interest	$35 \leq M \leq 49$	0	0 %
No Interest	$20 \leq M \leq 34$	0	0 %
<b>Total</b>		10	100 %

The increase in interest in learning in each cycle shows that learning media can increase the desire of students to learn *calistung* using *Smart Book* media. The increasing desire or interest in learning students through the *Smart Book* media that researchers use can help students in learning basic mathematics, namely *calistung* (baca, tulis, hitung). This result can be seen from the questionnaire answer scores that students filled out. According to the frequency distribution of students' learning interests using *Smart Book* media, a total of 10 students whose interest in learning increased after using *Smart Book* media. In the use of *Smart Book* media, students are trained according to the process, researchers also carry out activities as their response by providing assignment sheets related to the content of the *Smart Book* media, the purpose of this activity is none other than increase students' interest in learning to continue learning even though they are not at school.

The results of research in cycle 1 of the use of "*Smart Book*" media in learning activities show the success of students in learning mathematics from internal factors, namely the attitude, talent, interest of students to learn *Calistung* using the media. Learners also have fun, involvement, and attention when using the "*Smart Book*" media. While the results of research in cycle 2 showed an increase in student interest in learning using the "*Smart Book*" media where this success was supported by external factors,

namely the external environment such as teachers, family, and peers. In cycle 2, teachers play an important role because they provide direction and use "Smart Book" media which has interesting visualizations and colors on *calistung* problems so as to increase student interest in learning mathematics.

Learning *baca, tulis, hitung (calistung)* is a fundamental aspect of mathematics education and serves as a cornerstone for early learning. The use of *Smart Book* media in mathematics learning has proven to be highly effective in fostering interest and engagement among students. However, while media plays a crucial role, the support of families, teachers, and peers is equally essential. At home, families and parents are pivotal in stimulating the child's learning of reading, writing, and arithmetic. Meanwhile, teachers and peers contribute to the classroom learning experience by delivering engaging material through interactive media and fostering collaborative learning.

This research demonstrates that *calistung*-based *Smart Book* media significantly enhances students' interest in learning. The average score improvement before and after using the *SMART BOOK* was 38.1 points, equivalent to a 47.625% increase. The frequency distribution analysis further confirms that all students showed heightened interest after using the *Smart Book*. These findings align with previous studies, such as Noviana et al. (2023), who reported improved literacy skills through *Busy Book* media, and Fadilah et al. (2022), who found that *Powtoon* media increased learning interest in thematic lessons for Grade 5 students. Similarly, Ardiansyah (2020) highlighted the effectiveness of *Google Form* learning media in boosting interest and academic outcomes in mathematics for Grade 10 students.

This study underscores the importance of integrating innovative learning media like *Smart Book* into educational practices, complemented by family and peer support, to maximize student engagement and foundational skill development.

#### 4. CONCLUSION

This research highlights the critical role of learning interest, an intrinsic desire to engage in educational activities, in achieving positive academic outcomes. The findings indicate that the *Smart Book* media effectively enhances student interest in learning mathematics in Grade 1, transforming previously low engagement levels into increased enthusiasm, as evidenced by improved questionnaire scores and percentages. The media, designed as a *calistung*-based tool, fosters foundational skills like number recognition and calculation, demonstrating its potential to make learning more interactive and appealing.

However, the study is limited to assessing the impact of *Smart Book* on early-grade students' interest in mathematics learning. Future research could explore the broader applicability of *Smart Book* media across various subjects beyond *calistung*, as well as its role in enhancing not only interest but also academic abilities. Expanding the scope of *Smart Book* and refining its design to suit diverse educational contexts would provide valuable insights and further support its integration into teaching practices.

The implications of this study underscore the importance of innovative media in fostering a supportive and engaging learning environment. Teachers, parents, and policymakers can leverage tools like *Smart Book* to cultivate both interest and foundational skills in young learners. This research serves as a foundation for further exploration into the development of educational media that can holistically address student needs and foster lifelong learning.

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