Vol.2 No.1 April 2026 Hal.13-22
E-ISSN : 3109-5453 | P-ISSN : 3109-5534
DOI : xxxxxxxxxxxxxxxxxxxxxxxxxxxx
https://journal.multidisciplinaryeducation.com/jme

KALONG AS A LEARNING MEDIUM IN DEBIT MATERIAL: FOSTERING CONCEPTUAL UNDERSTANDING

Asyifa Nurhaliza[1], Liza Ayu Mareta[2], Rizka Ameilia[3], Tasya[4], Sisnawati[5]

[1,2,3,4,5] Elementary School Teacher Education Program, University Lampung, Indonesia

asyifanurhaliza2@gmail.com[1], maretalizaayu@gmail.com[2], amel27rizka@gmail.com[3], tasyahn83@gmail.com[4], sisnaw26@gmail.com[5]

ABSTRACT

This research is motivated by students' low understanding of the concept of debit, which is related to the lack of supportive learning media. This results in students having difficulty understanding the material. This study aims to test the effectiveness of the use of kalong media as a learning aid in improving students' understanding of the concept of discharge. By involving 18 students in grade V of SDN 6 Metro Pusat as research subjects, the method used was a descriptive quantitative method. The instrument used to measure the level of students' understanding was a questionnaire, which was developed to find out how far the concept of discharge can be understood after the use of kalong media. Based on the results of data analysis obtained from the questionnaire, kalong media is proven to be able to improve student understanding. The use of this media allows students to more easily understand the concept of debit through real and interesting demonstrations. The average score of the questionnaire results showed that the majority of students responded positively to the use of this media, with a significant improvement in the understanding of the concept of debit. Thus, kalong media (can of holes) can be considered an effective learning tool to help students better understand the concept of debit in a practical and interactive way.

Keywords*: *Learning Media, Kalong, Debit

Article History
Submitted: 1 September 2025
Received: 29 January 2026
Published: 30 April 2026

A. INTRODUCTION

In the pursuit of enhancing the overall quality and effectiveness of mathematics education, it becomes imperative for educators to consistently seek out and explore innovative and interactive alternative pedagogical tools and media that can facilitate a deeper understanding of mathematical concepts among students. One notable example of such alternative learning media is Kalong media, often referred to as perforated cans, which has been meticulously designed with the express purpose of assisting students in grasping the concept of discharge in a manner that is significantly more dynamic, engaging, and interactive. These perforated cans are ingeniously modified to include strategically placed holes, which enable students to visually observe the dynamic changes in the volume of liquid as it flows through these openings, thereby fostering a more hands-on learning experience.

Kalong media, or what is commonly known as perforated cans, represents a noteworthy innovation within the realm of educational methodologies, specifically aimed at facilitating a more effective comprehension of the

Vol.2 No.1 April 2026 Hal.13-22
E-ISSN : 3109-5453 | P-ISSN : 3109-5534
DOI : xxxxxxxxxxxxxxxxxxxxxxxxxxxx
https://journal.multidisciplinaryeducation.com/jme

concept of discharge among students. By utilizing these repurposed perforated cans, students are afforded the opportunity to engage in direct, hands-on experiments that allow them to calculate and analyze water discharge in real-time. This experiential learning approach not only enhances

students' understanding of mathematical principles but also serves to stimulate their creativity and foster collaborative efforts among peers. The incorporation of such experience-based learning strategies significantly enhances the overall learning process, rendering it more captivating and less monotonous, which in turn cultivates a heightened sense of involvement and enthusiasm for the subject of mathematics among students. Consequently, students are able to directly observe the volumetric alterations associated with the concept of discharge, thereby making the underlying principles easier to grasp, comprehend, and retain in their long-term memory.

According to Padli, P. (2013), the term "discharge" can be defined as the velocity of fluid flow measured per unit of time, which is a critical concept in various fields of study. The term discharge is particularly relevant when monitoring the capacity or storage capabilities of water within natural or artificial bodies such as rivers, dams, or reservoirs, thereby facilitating effective management and control of water resources. In order to accurately determine the volume of water discharge occurring at a specific location during a designated timeframe, precise measurements are conducted by assessing the flow velocity expressed in meters per second (m/s) alongside the wet cross-sectional area of the flow measured in square meters (m^2). By executing a multiplication of these two critical variables, one can derive the total volume of water flow expressed in cubic meters per second (m^3/s). Within the context of school-based learning, flow rate can be elucidated as the ratio of a specific volume to a corresponding unit of time, wherein volume can be derived by multiplying the established flow rate by the necessary time duration, or alternatively, by utilizing a measuring cup to directly assess the volume.

In practical terms, fifth-grade students enrolled at SDN 6 Metro Pusat have expressed a general disinterest in the instructional material related to water discharge, attributing this lack of engagement to the predominance of traditional learning activities characterized by lectures and monotonous note-taking practices, which ultimately hinder their ability to fully grasp the core concepts being taught. As a direct consequence of this pedagogical approach, the learning experiences imparted to students tend to lack memorability and fail to be absorbed to the fullest extent, resulting in a superficial understanding of the subject matter. Given the aforementioned circumstances, it becomes critically important for educators to undertake a comprehensive reassessment and enhancement of the learning process, thereby ensuring that students develop a greater interest in the material pertaining to water discharge and achieve higher levels of success in their mathematical studies.

In order to cultivate and enhance the students' comprehension and grasp of the intricate material pertaining to the concept of flow rate, the instructor initiated the lesson by articulating the fundamentals of flow rate using uncomplicated and easily digestible terminology. The students were subsequently provided with a foundational understanding of the flow rate equation, which is mathematically represented as the volume of liquid divided by the time required for that volume to pass through a given point. To further enrich the learning experience, the educator introduced the innovative use of

perforated cans—specifically, milk cans that have been deliberately punctured with holes—as a tangible and alternative medium for learning. These specially designed perforated cans were utilized to temporarily contain a specified volume of water, allowing students to engage more interactively with the material being taught. In preparation for the experiment, the teacher also arranged for a timer or stopwatch to accurately measure the speed at which the water flows out when the adhesive duct tape is removed from the bottom of the can. Prior to the commencement of the experiment, the volume of water intended for use was meticulously measured using a measuring cup, ensuring that the exact quantity was documented for the experiment. As the students conducted the experiment, they closely observed the duration of time required for the water within the milk can to completely drain out, thereby facilitating a hands-on understanding of the concept of flow rate. Through this engaging and practical experiment, it is anticipated that students will gain a more profound understanding of flow rate by experiencing the phenomenon in a realistic and relatable manner.

From the elaboration provided above, it becomes evident that the challenges faced by students in grasping the concept of discharge can be largely attributed to a deficiency in appropriate and supportive learning media that adequately convey the necessary principles. Consequently, it is imperative to undertake relevant research focused on the development of a robust understanding of the concept of discharge, utilizing perforated cans as a teaching tool, specifically targeting fifth-grade students enrolled at SDN 6 Metro Pusat. This research initiative aims to bridge the existing gap in comprehension and facilitate a more effective and engaging learning environment that fosters deeper insights into the fundamental principles of discharge and flow rate among young learners.

B. RESEARCH METHODOLOGY

Regarding the methodological approach used in the scope of this study, it is important to highlight that quantitative descriptive methodology has been carefully applied. Quantitative research, which is fundamentally based on the postpositivism paradigm, serves as an important investigative method that plays a significant role in the development of scientific knowledge, especially in areas such as establishing cause-and-effect relationships, simplifying complex phenomena into manageable variables, and formulating testable hypotheses, as mentioned by Pacifier in 2009. On the other hand, systematic data collection has been effectively carried out using questionnaire techniques, which are recognized as a powerful means of gathering information. According to Sugiyono (2017:142), questionnaires or survey instruments are specific data collection techniques carried out by presenting a series of carefully designed written questions or statements to respondents, who are then tasked with providing thoughtful responses. Furthermore, it is important to choose analysis techniques that are appropriate for the purpose and nature of the data collected, ensuring that the analysis is relevant and provides insights. Each phase of this systematic approach is designed to contribute to a comprehensive understanding of the research topic being studied. In addition, the integration of these methodological components

reflects a commitment to rigor and precision in the pursuit of knowledge. Ultimately, the techniques and strategies chosen not only facilitate effective data collection but also enhance the overall validity and reliability of the research findings. The collaborative interaction between data collection and analysis forms the backbone of empirical investigation aimed at generating meaningful and actionable insights.

C. RESULTS AND DISCUSSION

1. Definition of Learning Media

The role of media in the context of education is undeniably a highly strategic tool that significantly influences the overall effectiveness and success of the teaching and learning process, playing an important role in shaping educational outcomes. The existence and use of media in this context can directly trigger its own dynamic interactions among various participants in the educational landscape, including students, teachers, and educational institutions. The term “learning media” comes from the Latin word “medius,” which translates to “middle,” “intermediate,” or “intermediary,” thus indicating a position of facilitation in the acquisition of knowledge. In Arabic, the concept of media refers to an intermediary or channel through which messages are transmitted from the sender to the intended recipient, thus emphasizing its function in communication. Specifically, Gerlach and Ely articulate that media, when understood comprehensively, encompasses not only physical objects but also people and events that collectively create the conditions necessary for students to successfully acquire knowledge, develop skills, or cultivate attitudes. In this broader perspective, elements such as the role of the teacher, the textbooks used, and the school environment as a whole collectively form what can be categorized as media. More specifically, in the context of the teaching-learning process, the term media is often articulated as encompassing various graphic, photographic, or electronic tools designed to capture, process, and reorganize visual and verbal information in a manner conducive to learning. The Association for Educational Communications and Technology (AECT) further refines this definition by characterizing media as any form used for the process of transmitting information from one entity to another.

In essence, media can be understood as any entity that involves the senses, functioning as an intermediary, means, or tool that facilitates the communication process, especially in the realm of teaching and learning. The designation of learning media refers to tools and resources that can be used to enhance the learning journey, making it more effective and optimal for all participants involved. In contemporary education, the learning process has evolved beyond mere dependence on traditional books and blackboards; today, a large number of diverse learning media options are available for instructors to incorporate into their teaching methodologies. According to Latuheru (1988:14), the concept of media is articulated as any material or tool used in teaching and learning activities, specifically aimed at ensuring that educational communication interactions between educators and students occur in an effective and beneficial manner, while also encompassing various methods or techniques to achieve these goals.

From Azhar's (2011) perspective, the definition of learning media includes any tools that facilitate the learning process, both within the classroom and in external environments, further explaining that learning media are an integral component of educational resources or physical vehicles that summarize instructional material designed to stimulate student engagement and learning. Rayanda Asyar (2012) expands on this idea by suggesting that learning media can be understood as any entity capable of conveying or transmitting messages from a source in a systematic and planned manner, ultimately resulting in a conducive learning environment that allows recipients to carry out the learning process with efficiency and effectiveness.

In a broader context, learning media can be characterized as a strategic instrument in the educational process, playing an important role in determining the overall success of teaching and learning activities. Such media not only serve as visual or auditory aids, but also function as important intermediaries that facilitate the transfer of information from educators or learning sources to students, thereby enhancing the educational experience. The concept of learning media covers various aspects and can be defined from a broad and more specific perspective, depending on the context in which it is applied.

From the insights related to learning media presented, it is clear that learning media encompasses any resource or tool that can be used to convey information, ideas, or messages throughout the learning process, ultimately improving the understanding, skills, and attitudes of learners. Learning media thus acts as an intermediary or aid that significantly helps students understand the material presented, leading to a more effective overall learning experience.

2. Bat Media (Hollow Can)

The Kalong media, commonly referred to as a can bolong, serves as an innovative educational tool that significantly enhances the learning experience in mathematics, particularly in understanding complex discharge concepts. The term “Kalong” comes from “kantin bolong,” which translates to a specially designed can that has been deliberately perforated to facilitate accurate measurement of water flow dynamics. In applied practice, students engage in hands-on experiences by filling the can with air, then calculating the duration required for the air to completely flow out, allowing them to understand the basic formula for discharge, which is expressed as discharge = volume/time.

This specialized educational medium typically manifests as a carefully crafted can with small openings located on various sides. When water is poured into this can, it flows out through strategically placed holes, providing students with a visual representation of water pressure in action, enabling real-time observation and analysis.

The can bolong (perforated can) serves as an excellent alternative to conventional learning tools, as it consists of a milk can that has been expertly perforated, with the openings securely covered using duct tape to maintain the water volume temporarily. In preparation for the experiment, educators set up a timer or stopwatch, which is essential for accurately measuring the speed of the water flow after the duct tape is removed. Before pouring water into the

milk can, the volume is carefully measured using a measuring cup, ensuring precise quantification of water to facilitate a thorough understanding of the concept being explored.

Students are tasked with observing the time it takes for the water in the milk can to flow completely, allowing them to witness firsthand the practical implications of discharge as they engage in experiential learning activities. Through conducting this experiment, it is anticipated that students will develop a deeper understanding of the concept of discharge, transforming what could be an abstract idea into a more tangible and relatable experience. The incorporation of such media not only enriches the educational process but also significantly enhances students' creativity and enthusiasm for learning, resulting in a more interactive and enjoyable educational environment that fosters curiosity and engagement.

Figure 1. Bat Media (Hollow Can)

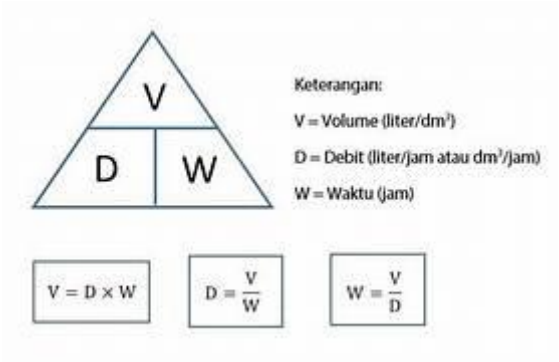
3. Debit in Mathematics

Discharge is a critical and fundamental aspect of measurement in mathematics, especially in analyzing fluid dynamics. In mathematics, discharge is specifically defined as the speed or velocity at which a certain volume of water flows through a specified cross-sectional area during a specified unit of time. The concept of discharge serves to describe the instantaneous velocity of a volume of water at a given time, as noted by Saptorini in 2009 on page 136 of his work. The amount of liquid measured is referred to as volume, which is quantitatively expressed in various units such as cubic meters (m^3), cubic centimeters (cm^3), cubic decimeters (dm^3), or alternatively in liters, which is a widely recognized metric for measuring liquids. Furthermore, the time dimension is articulated in standard units, which may include seconds, minutes, or hours, thus providing a time frame in which the discharge can be evaluated.

As stated by Asdak in 2002, discharge is basically understood as the rate of water flow, specifically quantified in terms of the volume of water that crosses a specific cross-sectional area in a specified unit of time. According to the insights provided by Hibbeler in the 2015 publication Engineering Mechanics: Dynamics, discharge can be comprehensively described as the total volume of fluid passing through a specified cross-section, measured over

a relevant time interval. Flow rate measurements are typically represented in commonly used units such as cubic meters per second (m^3/s) or liters per second (L/s), enabling a standard method of communication regarding water flow rates. From the explanation presented above, one can conclude that discharge effectively measures the volume of water flowing through a specific cross-section, whether it be a river, channel, pipe, or faucet, over a specified period of time.

In terms of mathematical representation, the formula used to calculate discharge is simply expressed as discharge equals volume divided by time, which succinctly summarizes the relationship between these fundamental variables..



4. **Research Results**
   Students' pre-test and post-test results before and after using the kalong (perforated tin can) media

1. able of Student Pre-Test and Post-Test Results

No.	Name	Pre-Test	Post-Test
1.	Alya Zhabiyyah Afifah	60	100
2.	Aldo Pranata	50	100
3.	Vilona Nahlia Ratu Vilona	60	100
4.	Syahla Faiza Dunant	60	100
5.	Adellwis Afini	70	100
6	Dzaki Surya Saputra	60	100
7.	Dewi Susanti	60	100
8.	Muhammad Khalis	60	100
9.	Naila Azaria	60	100
10.	Siti Nur Taufiqoh	70	100
11.	Riski Wahyudi	60	100
12.	Arkan Ramadhan	60	100
13.	M Afif athaya feldian	40	80
14.	Andra wuryawan	40	80
15.	Andra yuana	40	80
16.	Ria Dhotun nisa salah	30	80
17.	Marselina Zahwa Calista	30	80

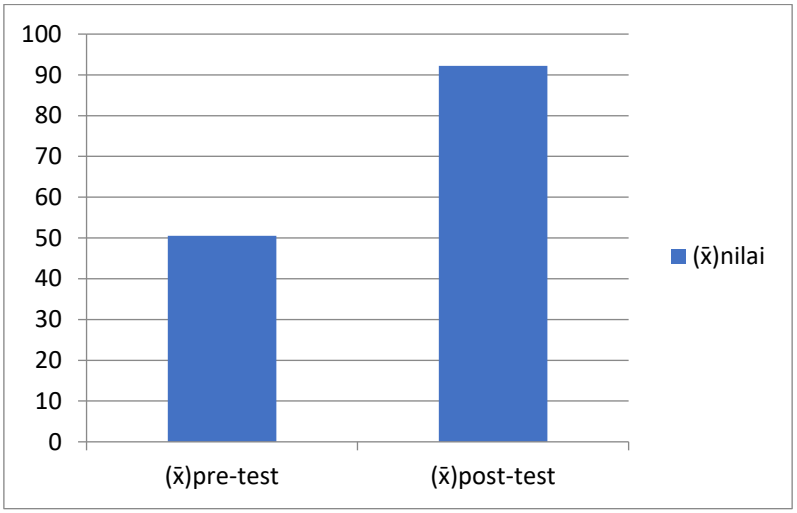
18.	Kayla Bilqis	0	60

The results of the quantitative descriptive analysis can be seen in Table

2. Comparison Table of Students' Pre-Test and Post-Test Results

Description	Number of students (N)	Lowest Value	Highest Score	Average
Hasil Pre-Test	18	0	70	50,5
Hasil Post-Test	18	50	100	92,2

3. Bar Chart of Students' Average Pre-Test and Post-Test Scores



Findings obtained from a comprehensive analysis of pre-test and post-test assessments show that the average score achieved by students before the implementation of the kalong media, also known as can bolong, was a modest 50.5. However, after the introduction and utilization of this innovative educational media, there was a remarkable surge in the average post-test score, which increased to an impressive 92.2. Such compelling data clearly illustrates a significant improvement in students' comprehension levels after their engagement with traditional learning media. In terms of performance metrics, it is worth noting that the lowest score recorded during the pre-testing phase was a complete zero, while the lowest achievement in the post-test improved significantly, landing at 60. Furthermore, it is important to highlight that the peak score achieved by students in the post-test reached a maximum of 100, representing a substantial leap from the highest pre-test score of 70. Collectively, these statistics clearly demonstrate clear and substantial progress in students' understanding of the release concept, as evidenced by the observed improvement in minimum and maximum performance indicators after the instructional period using this media.

The results obtained from further quantitative descriptive analysis prove that the integration of bat media has had a very positive effect on students'

understanding of the concept of release. This particular medium facilitates easier access to understanding of the subject matter through engaging and interactive demonstrations, which have consistently proven effective in improving the overall learning outcomes of the students involved. A significant majority of the student cohort showed considerable improvement, a fact clearly reflected in the comparison of pre-test and post-test scores, in addition to survey results revealing favorable responses to the incorporation of traditional media in the learning environment.

In conclusion, it is certain that kalong media, or can bolong, has the potential to be considered a highly effective educational tool, capable of helping students achieve a deeper and more practical understanding of the concept of release through methods that emphasize interactivity and real-world application.

D. CONCLUSION

This comprehensive study was carefully designed with the main objective of exploring and assessing the overall effectiveness of using tin cans, commonly known as tin bolong, as an innovative educational tool aimed at improving understanding of complex disposal concepts among fifth-grade students enrolled at SDN 6 Metro Center. This special learning medium cleverly uses perforated cans to accurately measure water flow, giving students a unique opportunity to observe real demonstrations that significantly strengthen and deepen their understanding of the concept of discharge in a practical context.

The findings obtained from this study convincingly show that after the implementation of the tin can media, there was a remarkable and noteworthy improvement in students' understanding of the concept of discharge, which was assessed quantitatively. Before the introduction of this engaging learning medium, the average pre-test score achieved by students was 50.5, whereas, after the application of the tin can medium, the average post-test score jumped to an impressive 92.2, illustrating a substantial improvement in their understanding. This remarkable increase in scores clearly shows that the kalong media serves as an effective pedagogical tool that facilitates a more interactive and enjoyable learning experience for students as they engage with the challenging concept of release.

In short, it can be stated with confidence that the kalong media is a significant and valuable innovation in the field of educational practice, especially in terms of improving the quality of mathematics learning through the integration of practical, interactive, and creatively designed release materials that meet the diverse learning needs of students.

E. REFERENCES

Asdak, C. 2002. Hidrologi dan Pengelolaan Daerah Aliran Sungai dalam Menghitung Debit. Gadjah Mada University Press. 630 hal.

Arsyad, Azhar., 2011, Media Pembelajaran, Rajawali Pers, Jakarta.

Asyar, Rayandra. 2012. Kreatif Mengembangkan Media Pembelajaran. Jakarta: Gaung Persada Press

Emzir. (2009). Metodologi Penelitian Pendidikan. Jakarta: Rajagrafindo Persada.

Fadilah, A., Nurzakiyah, K. R., Kanya, N. A., Hidayat, S. P., & Setiawan, U. (2023). Pengertian media, tujuan, fungsi, manfaat dan urgensi media pembelajaran. Journal of Student Research, 1(2), 01-17.

Padli, P. (2013). Peninjauan Debit Limpasan Saluran Macro Jalan A. Yani Kecamatan Tenggarong Kabupaten Kutai Kartanegara. Kurva Mahasiswa, 1(1), 110-116.

Rahmawati, W. (2021). Model Pembelajaran Open-Ended Sebagai Upaya Peningkatan Pemahaman Konsep Debit di Kelas V SDN Rembang 2 Kecamatan Sananwetan Kota Blitar. EDUKASIA: Jurnal Pendidikan dan Pembelajaran, 2(2), 245-255