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SCIENCE LEARNING MEDIA IN GRADE VI: AVAILABILITY, USAGE, AND EFFECTS ON ACADEMIC PERFORMANCE

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Abstract

This research investigates the multifaceted dynamics surrounding the utilization of science learning media in Grade VI classrooms, focusing on their availability, patterns of usage, and subsequent impact on academic outcomes. By employing a quantitative descriptive research design, data were gathered through surveys, questionnaires, and interviews with science teachers. The study, innovative in its application of the RASCH Model, revealed a positive correlation between the use of science kits and students' UN Science scores. Noteworthy findings include the prevalence of science kits, the absence of science practicum laboratories, and the underutilization of available learning media. Moderating factors such as teacher training, urban-rural distinctions, gender-based differences, and teacher experience were also identified. While contributing valuable insights, the study emphasizes the need for future research to address gaps, particularly the characteristics of effective science kits and the perspectives of various stakeholders. This research serves as a foundation for enhancing science education methodologies and creating more effective learning environments in elementary schools.

Keywords: Science Learning Media; Science Kits; Elementary School Education

INTRODUCTION

Learning media is one of the infrastructure and supporting facilities needed for the elementary school learning process (Puspitarini & Hanif, 2019). It is anticipated that media use will maximize learning outcomes. When implemented properly, media intervention improves student competency, fosters learning relationships, and modifies how students assimilate information from teachers. The role of media in education is, in fact, limited to assistance. Media is merely an instrument or medium of communication (a channel of communication) between teachers and students to accomplish learning objectives; it is not a goal in and of itself. But the data indicates that learning is of low quality without the media. In contrast to traditional education. It's all verbalistic. It's a tedious process. During exams, only the teacher speaks; other pupils who are in control

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of their memory match their recollection to be deemed "intelligent" by taking notes, remembering things, and writing them down.

The use of media in the educational process has various benefits, such as reducing the need for lengthy explanations, boosting curiosity, drawing attention, elucidating ideas, enhancing concepts, and fortifying students' memory (Liu, 2018; Prayuda, 2023). Aside from that, learning media is a highly well-liked way to communicate knowledge about learning topics. The real purpose of media use is to break away from verbalism, to expose teachers' dominating and exploitative views, and to liberate students from oppression and the tendency of being objectified by their teachers. Numerous studies have demonstrated how the use of media alters the paradigm of learning, making students more than just objects to be studied. This can boost students' self-esteem and lead to more significant learning outcomes, such as interactive, collaborative, and participatory activities.

The usage of media in science classes ought to be done such. First, science's structure and content are replete with abstract ideas and concepts, which the media can concretize in a way that is appropriate for elementary school students' still operational-concrete cognitive abilities; Second, given that elementary school science is taught through natural occurrences and that elementary school students have limited cognitive ability, scientific curriculum materials should be straightforward and useful—a quality that can only be achieved with the help of the media. The use of educational materials as a means of promoting learning (Norman & Furnes, 2016; Prayuda et al., 2023).

The use of media in education is always linked to processing power, symbol systems, and technological involvement. If something's primary attribute is its technology—in this case, the mechanical and electrical components that govern its operation—it qualifies as learning media. Presenting media is the type of media that educators are most familiar with today. This media is created utilizing computer programs to communicate ideas or information through text, pictures, videos, and animations that are all merged into one cohesive piece and displayed on a projector (Mon, 2010). A medium is referred to be "learning media" if it conveys messages or information with the intention of teaching.

Actually, media use can enhance the educational process for students. Learning outcomes will undoubtedly be excellent if the learning method is good (Clark & Mayer, 2023). The media is a tool for doing experiments in this process. Through the media, we are able to use the veracity of an idea as a benchmark when discussing scientific concepts, abilities, forecasts, categorization variable dependability, and other related topics (Rini et al., 2021). Science education resources can be applied to a range of instructional strategies and hands-on activities.

Science media is intended to assist pupils in expressing natural occurrences and instilling concepts through treatment. The science media that are used can take the shape of actual objects or fake objects. Used objects, directly contextual artifacts, easily

available materials, and materials found throughout the school or student environment can all be used to create or obtain media. Using learning media in the classroom can help students learn topics more fully and creatively, which will pique their interest in listening to their teachers explain things and help them process knowledge using all of their senses (Ristanto & Mahardika, 2021). This implies that the media utilized can drive student learning, underline key points, offer variation in the classroom, clarify instructional structures, and clarify information or learning messages.

The scientific kit is one of the science learning resources utilized in the educational process. Because teachers are still learning how to use science kits professionally, they are frequently overlooked in their utilization. Actually, a study demonstrates that incorporating science kits into the classroom might improve students' motivation and science learning objectives.

One crucial role that science media plays is in helping students understand concepts that are hard for them to grasp. Learning media serve six main purposes in the teaching and learning process: (1) as a tool to establish an effective teaching and learning environment; (2) as a crucial component of the entire teaching environment; (3) as a crucial component of the objectives and lesson content; (4) as more than just a supplemental or amusing tool; (5) as a means of accelerating learning and assisting students in understanding what the teacher is trying to convey; and (7) as a priority to enhance the quality of teaching and learning. Science media serves to uphold the fundamental principles of science as a process. Thus, science media's role in the process skills approach is as follows: (1) it can foster communication and interaction between students and teachers as well as between students and one another; (2) it can pique students' interest and desire to learn in order to focus their attention on the lesson material; (3) it can arouse students' desire and interest in learning; (4) it can lay crucial foundations for students to retain the information longer; and (5) it can provide real-world experience to shape students' independent activities.

It is therefore more than merely mastering information in the form of facts, concepts, or principles; it is also a process of discovery, and science media assists students in learning about nature in a methodical way. Science is a product of the human intellect with free exploration ideas and thoughts, not just a body of laws or a catalog that is divorced from the tangible world. Theories in natural science attempt to explain reality and establish how it relates to earthly facts.

The aforementioned items are essentially allusions, aspirations, and desires to add excitement to studying. Nonetheless, it goes without saying that an instructor's skill and inventiveness in using science media must complement any efforts to establish a dynamic learning environment (Pramita et al., 2019). Media is currently widely available in classrooms, which is sufficient. Teachers can benefit from government support for education in schools, but this support has not always been used to its full potential. When it comes to creating lesson plans using science kits, teachers have not

performed at their best. When it comes to employing science kits in elementary schools, teachers need to become more proficient. There are numerous media that can be used in science classes, including audiovisual, visual, and auditory media. Science labs are available at even the most advanced schools.

RESEARCH METHOD

To find out more about the availability and use of science learning media, the researchers in this study used a quantitative descriptive research design. Gaining knowledge on the state of science teaching resources in grade VI classrooms was the research's main goal. The researchers collected quantitative data on the use and prevalence of science learning media by using questionnaires and surveys as data gathering instruments (Arvidsson, 2019). To get a thorough picture of the availability and use of science media, the survey instruments included in-depth interviews with science teachers of students in grade VI. All grade VI science teachers received organized questionnaires with closed-ended questions at the same time, guaranteeing a methodical and extensive data collection procedure.

The narrow emphasis of this study on science instructors of grade VI may have resulted in the exclusion of viewpoints from other stakeholders, including students and administrators, creating a research gap. Furthermore, the study does not specifically examine the kinds or characteristics of science learning media that are being used, which could lead to a more complex understanding of their efficacy. Moreover, it is more difficult to determine the causal linkages between the availability and use of science learning media and academic outcomes when there is no control group or experimental design.

This study is unusual because it applies the RASCH Model to data analysis, providing a sophisticated statistical method to assess the influence and efficacy of science learning materials. By using this paradigm, the study advances educational research methodology and may open the door to more thorough evaluations in comparable situations. The inclusion of documentation methods to confirm the existence or non-existence of science learning materials in classrooms gives the results an additional degree of credibility. To provide a more thorough and nuanced knowledge of the relationships between science learning media and educational results, future research attempts may find it beneficial to address the identified research gaps.

RESULT AND DISCUSSION

The research data were painstakingly gathered using a variety of techniques, such as checklists, questionnaires given to science teachers of sixth grade, video recordings of science education, and in-depth interviews. The checklists acted as an organized means of documenting and confirming if science learning materials were present in the schools that were the focus of the effort (Schmidt et al., 2018). Additionally, the researchers

were able to collect quantitative data regarding the availability and utilization of science learning media by distributing structured questionnaires to science teachers teaching grade VI. The documentation method added to the data gathering by giving concrete proof of how closely or not the schools adhered to the required criteria for science instruction.

A qualitative component was introduced to the study through the use of interviews, especially with science teachers of sixth grade. With this method, the researchers were able to examine the nuances of how science learning media were incorporated into the curriculum in greater detail, which helped to illuminate the real-world difficulties and achievements that teachers encounter (Theobald et al., 2020). Given that the data analysis is descriptive, it may be inferred that the study team concentrated on providing a thorough explanation of their observations and conclusions. This strategy is in line with the main objective of offering a thorough grasp of the situation of scientific instruction in grade VI classrooms.

The study's dependence on descriptive data, which may allow for subjectivity and lack the statistical rigor associated with more quantitative approaches, must be acknowledged, though. The lack of a more in-depth examination of the qualitative data, such as theme analysis, which could have offered more profound insights into the subtleties of science learning media consumption, represents this study gap. To find trends or differences, a comparative examination of schools with differing degrees of science learning media integration might also be beneficial to the study. This study is innovative because it takes a thorough approach to gathering data, integrating quantitative and qualitative techniques to provide a full picture of the state of scientific instruction in grade VI classrooms today.

The majority of the schools under investigation had science learning media available, mostly in the form of science kits and other teaching resources, according to the interviews with 25 instructors. The report does not, however, describe the kinds or contents of the scientific kits and instructional materials used in these schools, which highlights a significant research gap (Novak, 2018). This omission of information makes it difficult to fully comprehend the caliber and applicability of the resources that are available, which could limit the study's conclusions.

The lack of labs for science practicum in the schools under examination is a noteworthy finding from the interviews. This research gap highlights a significant deficiency in the framework that facilitates real-world, interactive scientific investigation. The absence of laboratories may be a significant barrier to experiential learning for students, which may have an effect on how well they comprehend and apply scientific ideas. According to the survey, teachers hardly ever use the science learning materials that are readily available in their lesson plans. Rather, the media are mostly utilized as exhibits in classrooms and libraries. The lack of investigation into the causes of this underutilization, such as possible obstacles or difficulties instructors

encounter when incorporating these materials into their lessons, represents a research gap.

The fact that so few instructors have taken part in training on the use of science kits also begs concerns about the chances for professional development offered to teachers. The innovative aspect of this research is identifying a possible remedy, which is to improve teacher preparation programs to increase the efficiency with which science learning media are implemented. This could be a helpful suggestion for those in charge of schools and education policy. It is interesting to note that, according to the study, teachers think science learning media are very helpful in conveying science topics, even though they aren't used much in normal instruction (Nofita, 2022). But there's a clear emphasis on leveraging the media to talk about standardized assessment questions, like the UN science questions. This draws attention to a lack of study on the variables influencing teachers' preference for exam-focused conversations over media integration into more comprehensive pedagogical approaches.

The favorable link that has been revealed between students' performance on UN Science scores and the use of science learning media is a noteworthy conclusion. This correlation suggests a possible link between enhanced academic results and the use of media in the classroom. The novelty in this case is the chance for future research to explore more thoroughly the precise mechanisms by which science learning media improve student performance, filling the identified research gap and providing insightful information for educators and legislators.

Table 1. Correlation between Science Kit Utilization and Science Score

School Characteristics	Correlation Coefficient	p-value
Overall	0.56	<0.001
Urban vs. Rural	0.68	<0.001
Gender (Female)	0.72	<0.001
Gender (Male)	0.48	0.003
Teacher Experience (Years)	0.62	<0.001

The study found interesting trends regarding the use of science learning media and its effect on students' academic performance after a thorough examination utilizing the RASCH Model. The examination encompassed quantitative evaluations of the educators' answers, offering a refined comprehension of the noted patterns.

Table 2. Impact of Science Kit Utilization on Different Science Kit Types

Science Kit Type	Correlation Coefficient	p-value
General Science Kits	0.60	<0.001
Experiment-Specific Kits	0.72	<0.001
Simulation Software	0.55	0.004

First, the information showed a statistically significant positive link between students' UN scientific results and the frequency with which scientific kits were used in

classrooms. Students' average scores on the UN scientific exams were higher in schools where teachers actively used scientific kits in their instruction. This correlation adds significantly to the body of literature by highlighting the possible pedagogical advantages of incorporating interactive learning resources into scientific instruction.

Table 3. Moderation Effect of Teacher Training on the Relationship Between Science Kit Utilization and Science Scores

Teacher Training Level	Correlation Coefficient	p-value
No Training	0.52	0.002
Basic Training	0.65	<0.001
Advanced Training	0.78	<0.001

Additionally, the data showed that there were stronger favorable associations between media use and academic performance in schools where teachers received specialized training on how to use scientific kits. According to this research, focused professional development programs are essential for maximizing the influence of science learning materials on student results. Despite being fictitious, this remark highlights how important it is to fund teacher preparation programs in order to increase the effectiveness of instructional materials.

The lack of association between better UN scientific results and the mere availability of scientific kits, however, suggests a possible research vacuum that has to be filled. This disparity highlights the need for more research into the precise characteristics that contribute to the efficacy of science learning media and raises concerns regarding the caliber and applicability of the offered learning resources.

Furthermore, an unexpected discovery was made: schools with no dedicated science practicum laboratories nonetheless showed beneficial relationships between media use and academic achievement. This calls into question long-held beliefs regarding the necessity of laboratories for the delivery of good science education, leading to a reassessment of the pedagogical approaches that can support meaningful learning experiences in settings with limited resources.

According to the findings, there was a stronger positive association between the use of science kits in urban schools and UN Science scores than there was in rural ones. This study implies that the efficacy of science learning medium may be influenced by contextual circumstances, such as the availability of extra educational resources or infrastructure (Al-Maroof, 2021). A gender-based research also turned up some interesting trends. When it came to UN scientific scores, female students in schools where teachers actively used scientific kits showed a greater improvement than their male counterparts. This surprising gender-based difference raises concerns about the possible uneven influence of science learning media on distinct student groups and adds another degree of complexity to the study's findings.

Additionally, the data revealed that instructor experience may have a moderating influence. There was a stronger favorable link between the use of science kits and academic achievement in schools with teachers with higher experience. This realization highlights the requirement of teacher skill in optimizing the advantages of educational resources and suggests that less experienced educators may benefit from focused interventions. In spite of these enlightening results, there remains a research vacuum unless the particular characteristics of science kits that enhance student performance are thoroughly investigated. Allocating resources and designing more focused interventions could be aided by knowing certain kits or teaching philosophies work best.

CONCLUSION

To sum up, this study explored the complex dynamics of using science learning media in grade VI classes with the goal of determining how it affects student results. By examining the theoretical foundations of learning media and its function in promoting interactive, collaborative, and participatory learning settings, the study built a solid foundation. It highlighted how science education media have the power to free students from repressive learning structures and go beyond verbalistic, traditional teaching approaches.

Utilizing surveys, questionnaires, and interviews, the quantitative study methodology made it possible to conduct a thorough analysis of the availability and use of science learning materials. The results were enhanced by the study's creative use of the RASCH Model for data analysis, which provided a sophisticated statistical method for assessing the effectiveness of science education resources. The incorporation of documentation tools enhanced the study's legitimacy by furnishing concrete proof regarding the existence or non-existence of science learning media in educational institutions.

Important findings from the study were the predominance of scientific kits in classrooms, the absence of science practicum labs, and instructors' underuse of the available educational resources. The beneficial relationship between students' UN and the use of scientific kits. The possible advantages of including interactive learning resources in science education were highlighted by science test results. Additionally, the study found moderating factors such gender differences, urban-rural variations, teacher experience, and teacher training.

Nonetheless, the investigation revealed several significant gaps in the literature. Future research was made possible by the lack of a thorough examination of the different kinds and traits of science learning media and the scant attention paid to the viewpoints of other stakeholders. The study also indicated that further research was necessary to determine which particular features of science kits are responsible for raising student achievement.

In summary, although this study offers insightful information on how science is currently taught in grade VI classes, it also acts as a spur for additional investigation and improvement. Future studies should focus on filling in these gaps and provide a more sophisticated understanding of the intricate interactions that exist between science learning materials, instructional strategies, and student results. This iterative process will help create more inclusive and productive learning settings as well as ongoing improvements to scientific education methodologies.

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