



Availability and Utilization of IPAS Learning Media in Fourth grade Elementary Schools: An Analysis within the Ki Hajar Dewantoro School Cluster, Semarang Regency

Laelatul Fadilah¹, Nimas Puspitasari¹, Puji Winarti¹

¹Primary Teacher Education, FKIP, Universitas Darul Ulum Islamic Centre Sudirman GUPPI. Semarang

Corresponding Author: Laelatul Fadilah

Email: laelatulfadila9@gmail.com

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Abstract

The successful implementation of Integrated Science and Social Studies (IPAS) learning in elementary schools is closely related to the availability and effective utilization of learning media that can facilitate students' understanding of concepts and enhance their learning engagement. This study aimed to analyze the availability and utilization of IPAS learning media in Grade IV at public elementary schools within the Ki Hajar Dewantara Cluster, East Ungaran District, Semarang Regency. The study employed a qualitative descriptive approach. Data were collected through observations, interviews, and documentation involving Grade IV teachers and school principals from the selected schools. Data validity was ensured through source and technique triangulation, while data analysis followed the interactive model of data condensation, data display, and conclusion drawing. The findings revealed that the availability of IPAS learning media was generally adequate and included printed media, visual media, concrete media, and digital media such as textbooks, maps, globes, science kits, anatomical models, laptops, LCD projectors, and learning videos. However, several media resources were still limited in quantity, requiring shared use among classes. Furthermore, teachers had utilized various learning media effectively in classroom instruction, particularly PowerPoint presentations, videos, pictures, maps, globes, and simple teaching aids. The use of these media increased students' attention, motivation, participation, and conceptual understanding of IPAS content. The study concludes that both the availability and utilization of learning media play a significant role in supporting effective IPAS learning. Therefore, schools should enhance media provision and strengthen teachers' competencies in integrating innovative learning media into classroom practices.

Introduction

The implementation of the Merdeka Curriculum has introduced significant changes in elementary school learning, including the integration of Natural Sciences (IPA) and Social Sciences (IPS) into Natural and Social Sciences (IPAS). This integration aims to develop students' holistic understanding of natural and social phenomena in their environment. IPAS learning emphasizes not only conceptual understanding but also the development of critical thinking, problem-solving, scientific inquiry, collaboration, and evidence-based decision-

making skills (Suhelayanti et al., 2023). Therefore, effective IPAS learning requires innovative instructional strategies and appropriate learning media that meet students' needs and learning characteristics. Learning media play an important role in supporting the learning process by delivering instructional messages, clarifying abstract concepts, increasing motivation, and providing meaningful learning experiences. In IPAS learning, media are particularly essential because many concepts require visualization, demonstrations, simulations, and direct observations to connect scientific knowledge with real-life contexts. Appropriate learning media can encourage more active, engaging, and student-centered learning (Martanti et al., 2025; Ubaidillah et al., 2025; Arifah et al., 2025).

Previous studies have confirmed the significant contribution of learning media to improving IPAS learning quality in elementary schools. Pentianasari et al. (2023) found that interactive learning media assisted by Lectora Inspire demonstrated high validity, practicality, and effectiveness in supporting IPAS learning. Similarly, Setyawan et al. (2023) reported that interactive PowerPoint media improved students' attention and understanding of IPAS materials. Furthermore, Khairiyah et al. (2024) revealed that audio-visual media enhanced students' learning interest, concentration, and understanding of abstract IPAS concepts through the integration of images, sounds, and animations.

The advancement of digital technology has further transformed learning media utilization in elementary schools. Nanda et al. (2025) demonstrated that web-based interactive learning media supported the Merdeka Curriculum by facilitating independent, flexible, and interactive learning. However, Maisarah et al. (2023) found that although elementary teachers have a high need for digital learning media, they still face challenges related to limited technological facilities, insufficient training, and inadequate competence in developing digital media. This indicates that effective media utilization depends not only on technological availability but also on teachers' competencies.

Despite various innovations in learning media, their implementation in schools remains challenging. Mujtahid et al. (2025) reported that IPAS learning media utilization remains suboptimal due to limited facilities, insufficient media variations, and teachers' difficulties in integrating media into learning activities. Similarly, Andini et al. (2025) found that IPAS learning is still dominated by simple media, while technology-based media have not been optimally utilized. Meanwhile, Soi'mah et al. (2025) emphasized that appropriate learning media contribute significantly to improving students' learning outcomes by facilitating conceptual understanding, motivation, and active participation.

However, the availability and utilization of learning media remain uneven among elementary schools. A preliminary study in several schools within the Ki Hajar Dewantara School Cluster, East Ungaran District, Semarang Regency, revealed differences in media availability and utilization. Some schools experience limited facilities and rely on teacher-developed simple media, while others have adequate facilities but have not optimally utilized them. Teachers generally tend to use easily accessible media, such as textbooks and PowerPoint presentations, whereas interactive and technology-based media are still rarely implemented (Arochman & Fortinasari, 2024; Kumalasani et al., 2025; Khamidova & Nafosat, 2025).

These conditions indicate a gap between the availability of learning media and their actual utilization in IPAS learning. The success of the Merdeka Curriculum implementation depends not only on the availability of facilities but also on teachers' ability to effectively utilize learning media. Therefore, examining the actual conditions of learning media availability and

utilization is important to understand the readiness of elementary schools in implementing IPAS learning (Aisyah et al., 2023; Amelia & Dafit, 2023).

Previous studies have mainly focused on developing specific learning media, testing media effectiveness, or analyzing technology-based media implementation. Research by Pentianasari et al. (2023), Setyawan et al. (2023), Khairiyah et al. (2024), and Nanda et al. (2025) emphasized the effectiveness of particular media, while studies by Maisarah et al. (2023), Mujtahid et al. (2025), and Andini et al. (2025) examined media needs and utilization in specific contexts. Nevertheless, studies investigating the actual relationship between learning media availability and utilization in IPAS learning across several elementary schools within a single school cluster remain limited.

Therefore, this study addresses the research gap by analyzing the actual conditions of availability and utilization of fourth-grade IPAS learning media in several elementary schools within the Ki Hajar Dewantara School Cluster, East Ungaran District, Semarang Regency. Unlike previous studies focusing on media development or effectiveness testing, this study provides empirical evidence regarding the real conditions of IPAS learning media in schools. The findings are expected to serve as a basis for schools and policymakers in planning learning media provision and teacher competency development programs to support the successful implementation of the Merdeka Curriculum.

Methods

Research Design and Approach

This study employed a qualitative approach with a descriptive research design. The qualitative approach was used to gain an in-depth understanding of the availability and utilization conditions of fourth-grade IPAS learning media in elementary schools. A descriptive research design was selected because this study aimed to systematically describe phenomena based on factual conditions occurring in the field. Creswell & Creswell (2023) stated that qualitative research is conducted to explore and understand the meanings individuals or groups assign to social or educational issues.

Research Setting and Time

The study was conducted in February 2026 at public elementary schools within the Ki Hajar Dewantara School Cluster, East Ungaran District, Semarang Regency. The research sites included SD Negeri Kalongan 01, SD Negeri Kalongan 02, SD Negeri Kalongan 03, SD Negeri Kawengen 01, and SD Negeri Kawengen 02. These schools were selected based on their similar characteristics in terms of curriculum implementation, educational level, and school environmental conditions, allowing the researchers to obtain a comprehensive description of the availability and utilization of IPAS learning media.

Research Participants and Data Sources

The research participants consisted of seven fourth-grade teachers from five elementary schools within the Ki Hajar Dewantara School Cluster, East Ungaran District, Semarang Regency. Fourth-grade teachers were selected as the main informants because they directly implement IPAS learning and utilize learning media during instructional activities. The data sources consisted of primary and secondary data. Primary data were obtained through interviews and observations involving fourth-grade teachers, while secondary data were collected through documentation, including learning media, Learning Objective Flow, teaching

modules, school learning media inventories, and other supporting documents related to IPAS learning.

Data Collection Techniques

According to Sugiyono (2023), data collection techniques in qualitative research include interviews, observations, documentation, and triangulation. In this study, data were collected through interviews, observations, and documentation.

In-depth interviews were conducted with seven fourth-grade teachers to obtain information regarding the availability and utilization of IPAS learning media. The aspects of media availability explored included the existence of learning media, the quantity of available media, media conditions, and media accessibility. Meanwhile, the aspects of media utilization included the presentation of learning media, students' responses toward learning media, frequency of media use, and the impact of media utilization on the learning process.

Direct observations were conducted at schools to examine the actual conditions of learning media and their implementation in IPAS learning activities. Observation enabled the researchers to obtain factual data regarding teachers' use of media and students' responses during the learning process. Documentation was used to complement and strengthen the findings obtained from interviews and observations. The analyzed documents included research activity photographs, learning media inventories, ATP, teaching modules, and other documents related to fourth-grade IPAS learning.

Data Analysis Techniques

Data analysis was conducted using descriptive qualitative analysis based on the interactive model developed by Miles, Huberman, and Saldaña. This model consists of three main stages: data condensation, data display, and conclusion drawing. Miles et al. (2020) explained that these components operate interactively and continuously throughout the research process until data saturation is achieved and credible conclusions are established.

Data condensation was conducted by selecting, focusing, simplifying, and organizing data obtained from interviews, observations, and documentation to identify information relevant to the research objectives (Ghozali, 2021). The condensed data were then displayed in the form of narrative descriptions, matrices, and thematic representations to facilitate the identification of emerging patterns and findings. Data display assisted the researchers in systematically interpreting relationships among research findings.

The final stage involved drawing conclusions based on patterns, themes, and relationships identified during the data analysis process. The conclusions were continuously verified against field data to ensure the accuracy and credibility of the research interpretations.

Data Trustworthiness

The trustworthiness of the data was established through technical triangulation. Sugiyono (2023) explained that technical triangulation involves comparing data obtained through different data collection techniques to examine the consistency of the information. In this study, triangulation was conducted by comparing interview results, observation findings, and documentation related to the availability and utilization of IPAS learning media. This process ensured that the obtained data were valid, consistent, and reliable.

Results And Discussion

Availability Of IPAS Learning Media

The Findings Indicate That IPAS Learning Media Were Available In All Five Public Elementary Schools Within The Ki Hajar Dewantara School Cluster. The Available Media Included Printed Media (Textbooks And Student Worksheets), Visual Media (Pictures, Maps, And Globes), Concrete Learning Media (Science Kits And Anatomical Models), And Digital Media (Laptops, LCD Projectors, And Instructional Videos). Although Every School Possessed Learning Media To Support IPAS Instruction, The Completeness, Accessibility, And Quantity Of These Resources Varied Across Schools.

Interview Data Revealed That Teachers Generally Considered The Available Media Adequate For Implementing IPAS Learning. However, They Also Emphasized That Several Practical Teaching Aids And Digital Equipment Were Insufficient In Quantity, Requiring Teachers To Share Resources Among Classrooms. One Teacher Explained:

"The Available Learning Media Have Been Sufficiently Helpful In Supporting IPAS Learning, Particularly LCD Projectors, Laptops, And Several Science Teaching Aids. However, Certain Practical Equipment Is Still Limited In Number, So It Must Be Used Alternately." (G1).

Similarly, Another Teacher Stated:

"For Certain Topics, We Still Seek Additional Media From The Internet Or Create Simple Learning Media Independently Because The Available Media Do Not Yet Cover All IPAS Materials." (G4)

Classroom Observations Confirmed These Interview Findings. Most Learning Media Were Properly Maintained And Stored Either Inside Classrooms Or In School Storage Rooms. Nevertheless, Several Science Teaching Aids Showed Signs Of Prolonged Use, And Practical Equipment Was Often Shared Among Different Classes Because Of Limited Availability. To Illustrate Differences Among The Participating Schools, Table 1 Summarizes The Availability Of IPAS Learning Media.

Table 1. Cross-School Availability Of IPAS Learning Media

School	Printed Media	Visual Media	Concrete Media	Digital Media	Main Limitation
SD Negeri Kalongan 01	Complete	Complete	Science kits, globe	Laptop, LCD projector, instructional videos	Limited number of science kits for simultaneous classroom use
SD Negeri Kalongan 02	Complete	Complete	Globe and simple teaching aids	Laptop, LCD projector	Limited anatomical models and practical equipment
SD Negeri Kalongan 03	Complete	Complete	Science kits	Laptop and LCD projector	Limited digital media and practical teaching aids

SD Negeri Kawengen 01	Complete	Complete	Globe, anatomical models, science kits	Laptop, LCD projector, internet-based videos	Shared use of practical equipment among classes
SD Negeri Kawengen 02	Complete	Complete	Science kits and simple teaching aids	Laptop and LCD projector	Limited number of digital devices and science kits

Overall, Schools A and D possessed relatively more complete collections of learning media, particularly digital resources and concrete teaching aids. In contrast, Schools B, C, and E relied more heavily on printed materials and teacher-developed instructional media because specialized equipment for several IPAS topics remained limited. Documentation data further indicated that most digital equipment had been procured through school operational funding, whereas replacement of damaged science kits had not yet been conducted in several schools. Despite these differences, observations across all five schools showed that teachers were generally able to access available media whenever needed. However, when multiple classes required the same equipment simultaneously, teachers frequently adjusted their lesson plans or substituted unavailable media with simpler alternatives. Taken together, the interview, observation, and documentation findings indicate that the availability of IPAS learning media across the Ki Hajar Dewantara School Cluster can be considered relatively adequate. Nevertheless, disparities in equipment quantity and accessibility continue to influence teachers' instructional choices, particularly for learning activities requiring practical experiments or digital visualization.

Utilization of IPAS Learning Media

Interview findings demonstrated that fourth-grade teachers regularly incorporated learning media into IPAS instruction. Although the frequency and variety of media differed across schools, teachers consistently reported integrating learning media whenever the lesson content required visualization, demonstration, or practical activities.

The most frequently utilized learning media included PowerPoint presentations, instructional videos, pictures, globes, maps, science kits, and teacher-developed teaching aids. Teachers explained that media selection depended primarily on the characteristics of the learning topic and the availability of school facilities.

One teacher stated:

"When using videos or pictures, students are usually more focused and ask more questions. They seem to understand the materials more easily compared with lessons explained only verbally."

(G2) Another teacher explained:

"Learning media make students more interested in participating during lessons. They become more active during discussions and appear to remember the learning materials more easily." (G6)

Classroom observations supported these perceptions. During lessons involving visual or concrete learning media, students generally appeared more attentive, actively participated in classroom discussions, asked more questions, and showed greater involvement in learning activities compared with lessons relying primarily on verbal explanations. These observations

represent classroom behaviors noted during the study and should be interpreted as observational evidence rather than direct measurements of learning outcomes or motivation. The utilization of learning media also differed slightly among schools. Schools with more complete facilities tended to integrate digital media more frequently, whereas schools with fewer digital resources relied more on printed materials and teacher-made instructional aids.

Table 2. Cross-School Utilization of IPAS Learning Media

School	Frequently Used Media	Typical Frequency	Examples of IPAS Topics
SD Negeri Kalongan 01	PowerPoint, instructional videos, science kits	Almost every IPAS lesson	Human body systems, ecosystem, energy
SD Negeri Kalongan 02	Pictures, maps, globe, PowerPoint	2–3 lessons per week	Maps, weather, natural resources
SD Negeri Kalongan 03	Pictures, science kits, worksheets	Topic-dependent	Plant growth, simple experiments
SD Negeri Kawengen 01	Videos, PowerPoint, anatomical models	Almost every IPAS lesson	Human organs, solar system, environment
SD Negeri Kawengen 02	Globe, pictures, teacher-made teaching aids	Topic-dependent	Earth and space, living things

Across all schools, teachers adapted media to the characteristics of individual IPAS topics. Concrete media such as science kits and anatomical models were generally used during practical or observation-based lessons, while PowerPoint presentations, instructional videos, and pictures were more frequently employed to explain abstract concepts or natural phenomena that could not be directly observed in the classroom. Observation data further indicated that the actual use of learning media was influenced not only by their availability but also by practical considerations such as preparation time, scheduling conflicts, internet connectivity, and the need to share equipment among classes. Consequently, teachers often supplemented existing school resources by creating simple instructional media or obtaining additional learning materials from online sources. Overall, the findings suggest that IPAS learning media were routinely incorporated into classroom instruction across the five participating schools. However, the extent of utilization varied according to resource availability, teachers' instructional decisions, and contextual conditions within each school. Rather than demonstrating the effectiveness of learning media, these findings indicate that teachers perceived media as useful in supporting classroom instruction, while classroom observations suggested higher levels of student attention and participation during media-supported lessons.

Availability and Utilization of IPAS Learning Media

The present study demonstrates that all five elementary schools possessed various forms of IPAS learning media, including printed, visual, concrete, and digital resources. The available media comprised textbooks, student worksheets, pictures, maps, globes, science kits, anatomical models, laptops, LCD projectors, and instructional videos. However, the findings indicate that the availability of learning media did not automatically translate into consistent classroom utilization. Differences in the quantity, accessibility, condition, and scheduling of instructional resources influenced how frequently teachers were able to integrate them into IPAS learning. Schools with relatively complete facilities, such as SD Negeri Kalongan 01 and SD Negeri Kawengen 01, incorporated digital media more regularly, whereas the remaining

schools relied more heavily on printed materials and teacher-developed instructional aids. These findings suggest that media availability should be understood not merely as ownership of educational resources but also as their accessibility and usability within everyday classroom practice.

This finding extends previous studies by demonstrating that adequate infrastructure alone does not ensure intensive media integration. Instead, media utilization is influenced by practical classroom conditions, including equipment accessibility, lesson scheduling, and the suitability of instructional media for specific learning objectives. This observation is consistent with Maisarah et al. (2023), who emphasized that digital learning media are essential for facilitating interactive and meaningful IPAS learning experiences. Similarly, Mayer's (2017) Cognitive Theory of Multimedia Learning argues that combining verbal and visual information enhances students' cognitive processing and conceptual understanding. Nevertheless, the present findings indicate that these theoretical advantages can only be realized when teachers have reliable access to appropriate instructional resources.

Resource limitations remained a recurring issue across the participating schools. Teachers reported that science kits, practical equipment, and digital devices were often insufficient in quantity and therefore had to be shared among several classrooms. Consequently, teachers occasionally modified lesson plans, postponed practical activities, or substituted unavailable equipment with simpler instructional media. These findings support Mujtahid et al. (2025), who identified limited instructional facilities as a persistent obstacle to effective IPAS implementation, and Andini et al. (2025), who observed that many elementary schools continue to rely on simple instructional media because technology-based resources remain limited. Classroom observations also revealed that although most learning media remained functional, several science kits showed signs of wear due to prolonged use. This finding aligns with Ayuni et al. (2025), who argued that the educational value of instructional media depends not only on their availability but also on their quality, feasibility, and maintenance. Likewise, Sung et al. (2017) and Salam et al. (2024) emphasized that successful technology integration requires adequate infrastructure, continuous maintenance, and equitable access. Overall, the findings indicate that improving IPAS learning requires not only the procurement of additional instructional media but also better resource management, maintenance, and equitable distribution across classrooms.

Teacher Competence in Optimizing Learning Media

Beyond resource availability, the findings reveal that teachers' pedagogical competence played a central role in determining the effective utilization of learning media. Across the five schools, teachers selected instructional media according to the characteristics of IPAS topics, classroom conditions, and available facilities. Even in schools with limited technological resources, teachers continued implementing media-supported instruction by adapting existing materials, creating simple teaching aids, or utilizing freely available online resources. These findings suggest that teacher competence mediates the relationship between media availability and actual classroom implementation (Liu et al., 2022; Yang, X., & Du, J. (2024; Maulyda et al., 2025).

Teachers consistently selected learning media based on instructional needs rather than technological sophistication. Concrete teaching aids, such as science kits and anatomical models, were primarily used during observation- and experiment-based lessons, whereas PowerPoint presentations, instructional videos, maps, and pictures were employed to explain abstract concepts and natural phenomena that could not be directly observed. Such instructional

decisions demonstrate teachers' pedagogical judgment in selecting media that support students' conceptual understanding. This interpretation is consistent with Mayer (2017), who argued that multimedia learning becomes effective when instructional media are intentionally designed to facilitate cognitive processing. Likewise, Setyawan et al. (2023) reported that interactive PowerPoint presentations improve classroom attention and conceptual understanding, while Khairiyah et al. (2024) highlighted the pedagogical value of audio-visual media in enhancing classroom engagement.

An important finding of this study is that conventional instructional media continue to play a significant role despite the increasing availability of digital technologies. Teachers frequently relied on pictures, maps, globes, worksheets, and self-developed teaching aids, particularly when digital equipment was unavailable or unsuitable for particular learning activities. This finding suggests that instructional effectiveness depends not exclusively on sophisticated technologies but on the pedagogical appropriateness of the selected media. Previous studies have demonstrated the educational potential of interactive multimedia, web-based learning, e-flipbooks, and other technology-assisted instructional media (Fitria et al., 2022; Islamyati & Manuaba, 2021; Hodaifah et al., 2024; Tiarasari, 2020; Nanda et al., 2025; Pentianasari et al., 2023; Aprilia et al., 2024; Ulfa et al., 2024). However, the present findings indicate that simple and teacher-developed instructional media remain equally valuable within schools where technological resources are unevenly distributed. Rather than replacing conventional media, digital technologies complement existing instructional practices according to local classroom needs.

Although teachers perceived that media-supported instruction increased students' attention and classroom participation, this study does not provide direct evidence regarding improvements in motivation, conceptual understanding, or academic achievement. Therefore, these findings should be interpreted as teachers' perceptions and classroom observations rather than causal evidence of instructional effectiveness, which is consistent with the qualitative design employed in this study.

Implications for IPAS Learning in Elementary Schools

The multi-site design of this study provides important insights into contextual differences among elementary schools within the same school cluster. Although all participating schools implemented the Merdeka Curriculum, patterns of learning media utilization differed according to resource availability, equipment accessibility, teacher initiative, and local school conditions. Schools possessing more complete digital facilities tended to integrate multimedia into classroom instruction more frequently, whereas schools with fewer technological resources demonstrated greater reliance on teacher creativity and conventional instructional media. These findings indicate that effective IPAS learning depends on the interaction between educational resources, teacher competence, and contextual school conditions rather than on infrastructure alone (Arif et al., 2025; Adhana & Andriani, 2024; Kusuma, 2025).

The findings have several practical implications for educational stakeholders. Schools should prioritize not only the procurement of instructional media but also their equitable distribution, regular maintenance, and accessibility across classrooms. At the same time, continuous professional development programs should strengthen teachers' competencies in selecting, adapting, and integrating both digital and conventional learning media into meaningful learning experiences. Such initiatives are expected to support more consistent implementation of the Merdeka Curriculum while reducing disparities in instructional practices among schools.

Overall, this study contributes empirical evidence regarding the relationship between learning media availability and utilization within elementary IPAS learning (Afifa, K., & Astuti, T. (2024; Ubaidillah et al., 2025; Yunita et al., 2025). The findings demonstrate that effective media utilization is shaped by the combined influence of teacher competence, school context, and resource management. Nevertheless, because this study employed a qualitative descriptive approach and did not directly measure students' academic achievement, motivation, or conceptual understanding, the findings should be interpreted as evidence of teachers' perceptions and observed classroom practices rather than causal evidence of learning effectiveness. Future studies may employ mixed-methods or experimental designs to examine the influence of learning media on students' learning outcomes while expanding the research to broader educational settings.

Conclusion

This study concludes that the availability of IPAS learning media for fourth-grade students in public elementary schools within the Ki Hajar Dewantara School Cluster, Semarang Regency, is relatively good, including printed, visual, concrete, and digital media. These media support contextual learning and help students understand abstract IPAS concepts. However, limitations remain in the quantity of certain practical and technology-based media, indicating the need for improved availability and distribution. The utilization of IPAS learning media by teachers has been implemented effectively through the use of PowerPoint, instructional videos, pictures, maps, globes, and teaching aids. The use of these media contributes to increasing students' attention, motivation, participation, and conceptual understanding. The findings highlight that effective IPAS learning depends not only on media availability but also on teachers' competence in selecting and utilizing appropriate media. This study contributes empirical insights into the actual conditions of IPAS learning media availability and utilization within a school cluster context. Unlike previous studies focusing mainly on the development or effectiveness of specific media, this study provides a comprehensive overview of media readiness and utilization in supporting the implementation of the Merdeka Curriculum in elementary schools.

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