

THE IMPLEMENTATION OF INTERACTIVE DIGITAL ENCYCLOPEDIA MEDIA TO ENHANCE PRIMARY SCHOOL STUDENTS' IPAS LEARNING MOTIVATION

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Abstract

This study aims to describe the learning motivation of fifth-grade students in the IPAS subject and to examine the application of interactive learning media based on a digital encyclopedia to improve that motivation. The research problem stems from the low learning motivation of fifth-grade students at SD Negeri 279 Palakka, which is caused by the reliance on static, conventional printed media. This study employed a qualitative approach using Classroom Action Research (CAR) based on the Kemmis and McTaggart model, conducted across two cycles involving 25 fifth-grade students. Quantitative data were obtained from learning motivation questionnaires and cognitive learning tests, while qualitative data were collected through classroom observation sheets. Data were analysed descriptively and comparatively between cycles. The results show that the pre-action motivation score averaged only 23.44 with 8% classical completeness. Motivation increased to 29.08 (48%) in Cycle I and rose sharply to 34.04 (84%) in Cycle II after classroom

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management improvements were implemented. Cognitive learning outcomes similarly improved, reaching 88% classical completeness by the end of Cycle II. The study concludes that interactive learning media based on a digital encyclopedia effectively and sustainably improves the learning motivation of fifth-grade students in the IPAS subject.

Keywords: Digital Encyclopedia, Interactive Media, Learning Motivation, IPAS, Classroom Action Research

INTRODUCTION

The ongoing digital transformation in Indonesian education has driven a paradigm shift in the delivery of learning at primary school level. The use of information and communication technology is no longer merely a supplement to teaching activities but a fundamental requirement for meeting the demands of the Merdeka Curriculum, which calls for interactive, inspiring, and challenging learning. This requirement is explicitly set out in Regulation of the Minister of Education, Culture, Research, and Technology Number 16 of 2022 concerning Process Standards, which affirms that the learning process must be organised through the optimal use of information technology. Teachers are required to transform abstract concepts into concrete and engaging visualisations so that students can more easily understand complex material. This is becoming increasingly relevant for the Natural and Social Sciences (IPAS) subject in Year 5 of primary school, given that its content frequently involves natural phenomena and cause-and-effect relationships that are difficult for students to observe directly.

Learning motivation plays a central role as a determinant of students' academic success, particularly in subjects that demand strong reasoning skills and a high level of conceptual understanding, such as IPAS. The role of digital technology in fostering the learning motivation of the current generation is reinforced by the findings of Yulistiawati et al. (2025), who revealed that primary school students' engagement with science-based digital content can shape scientific behaviour and naturally foster curiosity. A further study by Yulistiawati et al. (2025) also supports this argument by demonstrating a positive correlation between the intensity of digital technology use and improvements in students' competence and literacy during the learning process. Panginan, Awaliyah, and Ramadani (2023) likewise reported that a digital-literacy-based learning model proved effective in improving the scientific literacy of pre-service primary school teachers. These three findings provide empirical grounds that integrating digital media into the learning process has considerable potential to stimulate students' motivation and active engagement in learning. The recent findings of Amaliyah

and Yulistiawati (2026) further reinforce this point, showing that primary school students' digital scientific behaviour is shaped through patterns of visual observation, epistemic evaluation, and independent experimentation with technology-based scientific content, thereby strengthening the case for providing digital learning media that support the growth of students' scientific curiosity. Saqjuddin, Aba, and Aopmonaim (2025) further emphasise that innovative management of coding and artificial intelligence learning can strengthen students' digital literacy through technology-integrated learning practices.

In practice, however, this ideal of high student learning motivation is often at odds with reality, as found at SD Negeri 279 Palakka, Marioriwawo Subdistrict, Soppeng Regency. Initial observations and discussions with the class teacher in mid-December 2025 revealed that IPAS learning at the school remained conventional, relying on static printed media. This resulted in low student diligence in completing tasks, limited enthusiasm during the learning process, and a lack of confidence among students to ask questions or respond to material presented by the teacher. Mid-semester examination results further reinforced this picture, with around 70% of Year 5 students failing to reach the Minimum Completeness Criterion (KKM) of 70 in the IPAS subject, while only 30% of students achieved it. This gap in academic achievement provides strong evidence that students struggled to absorb the material without dynamic, interactive visual support.

The digital encyclopedia has emerged as a comprehensive alternative learning medium to bridge the need for visualising abstract IPAS material. Pratama (2021) defines a digital encyclopedia as a modern instructional medium that integrates text, colour illustrations, audio, and video animation into a single interactive learning system. Kurniawan and Zulherman (2021) developed a similar medium for ecosystem material for Year 5 primary school students and found that dynamic multimedia features could strengthen conceptual understanding while fostering enthusiasm for learning. Sandika (2021) added that information-technology-based learning media contributes significantly to improved student learning motivation because it offers a more varied learning experience than conventional methods. The independent navigation feature of the digital encyclopedia allows students to explore material at their own learning pace, so that students become active participants in the process of concept discovery rather than passive observers. Puspitarini and Hanif (2019) reinforced this view through their study in a primary school, which demonstrated that the use of

appropriate learning media can significantly increase student learning motivation compared with learning without media support.

The gap between the low learning motivation of Year 5 students at SD Negeri 279 Palakka and the need for innovative learning media underlies the application of interactive, digital-encyclopedia-based learning media as a concrete solution in this study. Rahman (2021) asserts that improving learning motivation cannot be separated from the quality of the stimulus provided by teachers through the selection of appropriately targeted media and teaching methods. Through his study on the use of instructional video, Muhammad (2022) also demonstrated that visual content packaged in an engaging way can increase primary school students' engagement in the learning process. The interactive nature of the digital encyclopedia medium, displayed via a digital TV screen or LCD projector, is expected to spark students' curiosity and drive a significant, sustained increase in their learning motivation. Optimising technology through digital encyclopedia media is regarded as a strategic step towards comprehensively improving the quality of IPAS learning in primary schools.

Several previous studies have demonstrated the effectiveness of video and animation media in increasing primary school students' interest and motivation across various subjects. Hadiah Tullah, Widiada, and Tahir (2022) found that the use of animated video had a significant effect on increasing the learning interest of Year 4 primary school students, particularly for material requiring concrete visualisation. Nurul (2022) reported similar results for the IPAS subject, where animated video media was shown to measurably boost student learning motivation through increased motivation-questionnaire scores. Pujiono, Januar Saputra, Wakhyudin, and Nuriafuri (2023) further confirmed that the use of LCD projectors in primary schools is positively correlated with the level of learning motivation among both lower- and upper-grade students. The consistency of findings across these studies reinforces the assumption that interactive visual media, including digital encyclopedias, has a genuine capacity to improve the learning motivation of primary school students in the current era of digital learning.

This study specifically aims to describe the learning motivation of Year 5 students at SD Negeri 279 Palakka in the IPAS subject and to analyse the application of interactive, digital-encyclopedia-based learning media in improving that motivation. Classroom Action Research was chosen as the research design because it allows the researcher to carry out direct intervention while reflecting on the effectiveness of the action cyclically. Wulandari (2023) showed that visual interactive multimedia effectively reduces learning fatigue among Year 5 primary

school students, a finding relevant to the context of the problem addressed in this study. The urgency of this study is further strengthened by the limited number of studies that specifically integrate digital encyclopedias with the context of IPAS learning under the Merdeka Curriculum in the Soppeng Regency area. The findings of this study are expected to make a practical contribution for teachers in designing more interactive IPAS learning, as well as a theoretical contribution to the development of digital-technology-based learning media in primary schools.

RESEARCH METHOD

This study employed a qualitative approach in the form of Classroom Action Research (CAR), based on the model of Kemmis and McTaggart (1988), which consists of four main components: planning, action, observation, and reflection. This design was chosen because it enables an in-depth description of the process of applying interactive, digital-encyclopedia-based learning media to improve Year 5 students' IPAS learning motivation. The research procedure was carried out across two cycles, each comprising interconnected stages of planning, action implementation, observation, and reflection. Each cycle consisted of two sessions, with an allocation of 2 x 35 minutes per session, covering opening, core, and closing activities. Completeness for each cycle was determined based on a classical learning-motivation success indicator of at least 75%, following Arikunto (2013) regarding the criteria for classical completeness in action research.

The study was conducted at SD Negeri 279 Palakka, Marioriwawo Subdistrict, Soppeng Regency, based on the consideration that the use of learning media in Year 5 at that school remained very limited to textbooks and static teaching aids. The research subjects comprised 25 Year 5 students, consisting of 13 boys and 12 girls with varied academic characteristics. The material used in Cycle I related to ecosystem components and food chains, while Cycle II focused on food webs and ecosystem balance. The operational definition of interactive, encyclopedia-based learning media in this study refers to a digital learning tool that presents structured information through five implementation steps: preparation, presentation and orientation, guided exploration, independent interaction, and evaluation and feedback. Learning motivation in this study was measured based on eight characteristics of learning motivation according to Sardiman (2018), including persistence in facing tasks, resilience in facing difficulties, interest in problems, independence in learning, and enjoyment in seeking out and solving problems.

Data collection was carried out through two types of data: quantitative and qualitative. Quantitative data were obtained from the results of the learning-motivation questionnaire administered at the pre-action stage, the end of Cycle I, and the end of Cycle II, as well as from students' cognitive learning test scores at the end of each cycle. Qualitative data were collected through learning-implementation observation sheets and student learning-motivation observation sheets completed by the collaborating teacher during the learning process. The sources of research data included students as the primary data source, the class teacher as a supporting data source regarding the implementation of the media, and administrative documents comprising student records and learning-motivation questionnaire results. The data-collection techniques used consisted of direct observation of classroom learning activities and the administration of a learning-motivation questionnaire, developed based on Sardiman's (2018) eight motivation indicators, at the end of each learning cycle.

The research instruments used consisted of observation sheets and a learning-motivation questionnaire. The observation sheets were divided into two parts: an observation sheet for the implementation of the encyclopedia-based interactive media, monitoring the extent to which the learning stages were carried out by the teacher, and an observation sheet for learning motivation, recording changes in students' affective behaviour during the learning process. The learning-motivation questionnaire was developed based on Sardiman's eight characteristics of learning motivation, adapted to both conventional learning and digital-media-based learning contexts. The data-analysis technique used was descriptive-comparative, comparing qualitative and quantitative data between cycles. Qualitative data analysis was conducted through an in-depth description of observation results concerning student engagement, attention, and enthusiasm, while quantitative data analysis was carried out by calculating the percentage of classical completeness and the class mean score using the Mean formula, following Sugiyono (2018). The resulting completeness percentages were then converted into categories of learning-motivation level, ranging from very low to very high, allowing the success of the action in each cycle to be interpreted objectively and measurably. The validity of the data was strengthened through triangulation of the motivation-questionnaire results, cognitive test scores, and the collaborating teacher's observation notes, so that conclusions regarding the success of the action were not based on a single type of data alone. The success criterion for the study was set such that the classical completeness percentage for learning motivation reached at least 75% of the

total number of Year 5 students, and the study would be terminated at the cycle in which this indicator was met.

RESULTS AND DISCUSSION

A. Findings

Overview of Year 5 Students' IPAS Learning Motivation Prior to the Intervention

The initial condition of Year 5 students' IPAS learning motivation at SD Negeri 279 Palakka was classified as very low, based on the results of the motivation questionnaire administered at the pre-action stage. The class mean motivation score reached only 23.44, with only 2 out of 25 students, or 8%, falling into the completed-motivation category. The remaining 23 students, or around 92%, fell into the low-motivation category, characterised by passive attitudes, boredom with note-taking routines, and a lack of confidence in asking questions during lessons. This low level of motivation was consistent with the initial observation results, which showed that daily IPAS learning remained dominated by lecture methods and static printed media, without dynamic visual support. Table 1 below presents a summary of students' learning-motivation scores at each stage of the study.

Table 1. Summary of Student Learning-Motivation Scores Across the Research Stages

Stage	Mean Score	Classical Completeness
Pre-Cycle I	23.44	8% (2 students)
Cycle I	29.08	48% (12 students)
Pre-Cycle II	27.28	28% (7 students)
Cycle II	34.04	84% (21 students)

Source: Primary data from the learning-motivation questionnaire, 2026

Increase in Learning Motivation in Cycle I

The application of interactive, digital-encyclopedia-based learning media in Cycle I showed a positive trend in students' learning motivation. The class mean motivation score rose from the initial condition to 29.08, with the number of students achieving completed motivation jumping from 2 to 12 students, or 48%. The video and animation features embedded in the digital encyclopedia proved able to stimulate students' curiosity and attention at the start of the lesson, particularly on the indicators of interest in problems and enjoyment in seeking out or solving them. This classical achievement of 48% did not yet meet the study's success target of at least 75%, so the action needed to be continued into the next cycle. The Cycle I reflection revealed a difficulty in the form of

excessive excitement, with some students competing with one another to operate the interactive media, causing students with a slower learning pace to become passive as they were overshadowed by their more dominant group members.

Data from the pre-action stage of Cycle II also showed fluctuation in students' learning motivation. The class mean score adjusted to 27.28, with classical completeness of 28%, or 7 students, representing a slight decline from the final Cycle I result. This decline was related to the change to a new IPAS sub-topic, namely food webs and ecosystem balance, which involved a higher level of conceptual difficulty than the previous material. This caused students to once again feel uncertain and less confident before the improvement action in Cycle II was optimised by the researcher. This phenomenon underscores the urgency of continuing to improve classroom management in order to stabilise students' learning motivation on an ongoing basis.

Increase in Learning Motivation in Cycle II and Cognitive Learning Outcomes

Improved classroom management in Cycle II, in the form of more orderly small-group formation and a fair rotation of media access, had a significant impact on the stability of students' learning motivation. The class mean motivation score grew rapidly to 34.04, with the number of students achieving completed motivation rising to 21, or 84%, exceeding the 75% success-indicator target. A total of 4 students, or 16%, had still not reached the completed-motivation category due to difficulties with confidence and concentration, although their progress still showed a better trend than the initial condition. This increase in learning motivation was directly proportional to students' cognitive learning outcomes, with the Cycle II post-test mean score reaching 34.88 and cognitive classical completeness reaching 88%, or 22 out of 25 students. Figure 1 shows the trend of increasing mean motivation scores and classical completeness from the pre-action stage to the end of Cycle II.

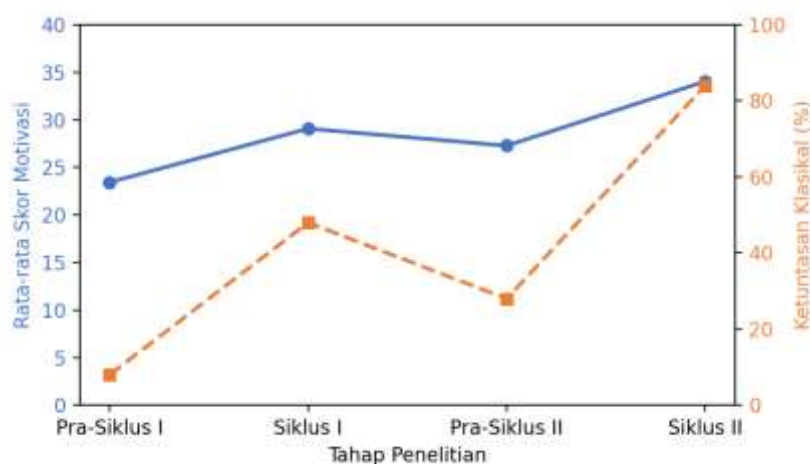


Figure 1. Trend of Increasing Learning Motivation among Year 5 Students at SD Negeri 279 Palakka

Source: Primary data from the learning-motivation questionnaire and learning-outcome tests, 2026

Implementation of the Interactive Encyclopedia-Based Learning Media

The implementation of interactive, digital-encyclopedia-based learning media was carried out through eight systematic stages: preparation and conditioning of the media, communication of the learning objectives, visualisation and display of the media, teacher guidance while watching the display, activation of student engagement, discussion and question-and-answer sessions, provision of practice exercises, and evaluation of cognitive learning outcomes. The implementation of these learning stages improved significantly from Cycle I to Cycle II, based on the collaborating teacher's observation sheet. The learning-implementation score in Cycle I reached 30, categorised as good, or 75%, with student guidance while observing the media and supervision of group discussions still requiring improvement, as the researcher was too focused on operating the media at the front of the class. The learning-implementation score rose to 37, categorised as very good, or 92.5%, in Cycle II, after the researcher actively moved around the classroom to guide students and applied an even rotation of media operation within small groups. This improvement in the researcher's teaching quality was directly proportional to the surge in students' learning motivation, from 48% in Cycle I to 84% in Cycle II.

B. Discussion

The successful improvement in Year 5 students' learning motivation in the IPAS subject at SD Negeri 279 Palakka provides empirical evidence of the effectiveness of integrating interactive, digital-encyclopedia-based learning media in addressing the problem of learning motivation in primary schools. The low mean motivation score at the pre-action stage, reaching only 23.44, indicates

a fundamental problem with the conventional teaching approach applied on a daily basis, particularly the use of monotonous printed textbooks and tedious note-taking routines. This is consistent with the view of Sardiman (2018), who asserts that motivation is a driving force within students that gives rise to learning activity, so that an unengaging learning stimulus will hinder the emergence of that driving force. Uno (2017) further explains that learning motivation is formed from interacting internal and external drives, so that the presence of an engaging external stimulus, such as learning media, plays an important role in awakening students' internal drive to learn. Sandika (2021) also asserts that information-technology-based learning media contributes significantly to improved learning motivation, as it offers a variety of learning experiences not obtained from conventional methods. The low motivation observed among 92% of students at the initial stage of this study demonstrates just how crucial it is to intervene with learning media capable of meeting the visual and emotional needs of primary school students.

The increase in the motivation score to 29.08 in Cycle I shows that the presence of visual elements in the form of interactive video and animation was able to spark students' initial interest in the ecosystem and food-chain material. Kurniawan and Zulherman (2021) reported similar findings in the development of digital encyclopedia media on ecosystem material for Year 5 primary school students, where interactive multimedia features were shown to strengthen understanding as well as students' enthusiasm for learning. Sari and Habibi (2020) reported similar results, showing that animation-based interactive learning media increased primary school students' motivation to learn science, reinforcing the assumption that dynamic visual elements are a major driving factor behind learning enthusiasm in scientific material. The 48% classical achievement in Cycle I was considered not yet optimal due to an operational difficulty in the form of excessive learning excitement, with students competing with one another to operate the interactive media on the teacher's laptop. This imbalance in interaction caused students with a slower learning pace to become passive, as they were overshadowed by their more dominant group members — a condition that underscores the importance of orderly classroom management in optimising the potential of digital media. The decline in the motivation score to 27.28 at the pre-action stage of Cycle II also shows that learning motivation is dynamic in nature and strongly influenced by the level of difficulty of the new material faced by students.

The rise in the motivation score to 34.04, with classical completeness of 84% in Cycle II, demonstrates that improved classroom management, through

small-group organisation and a fair rotation of media access, was the key to the successful application of interactive learning media in Year 5. Rahman (2021) emphasises that improving learning motivation depends heavily on the quality of the teacher's management of the learning process, not solely on the sophistication of the media used. Muhammad (2022) also demonstrated that structured visual content can increase primary school students' active engagement when accompanied by orderly and even-handed classroom management. The increase in the learning-implementation score from 30 to 37 in this study reinforces this argument, with the quality of teacher facilitation directly proportional to the surge in students' learning motivation from 48% to 84%. The improvement in students' cognitive learning outcomes, reaching 88% by the end of Cycle II, further confirms that the affective aspect of learning motivation is an important prerequisite for achieving optimal cognitive learning outcomes, consistent with the findings of Nurul (2022) regarding the effect of animated video media on students' learning motivation in the IPAS subject.

The findings of this study reinforce a number of previous studies on the role of digital technology in primary school learning, while also providing new context for the application of digital encyclopedias within the framework of the Merdeka Curriculum. Wulandari (2023) showed that visual interactive multimedia effectively reduces learning fatigue among Year 5 primary school students, consistent with the decline in passive attitudes and boredom observed in this study following the application of the digital encyclopedia. Yulistiawati et al. (2026) further confirm that primary school students' engagement with science-based digital content can shape patterns of scientific observation and authentic curiosity, patterns that were also evident in the increased enthusiasm of Year 5 students at SD Negeri 279 Palakka during the process of exploring the digital encyclopedia. The success of this study confirms that the effectiveness of interactive learning media is determined not only by the sophistication of its technological features but also by the teacher's ability to manage student interaction fairly and in an orderly manner within the classroom. The integration of motivation-questionnaire data, cognitive test results, and learning-process observation sheets consistently points to the conclusion that interactive, digital-encyclopedia-based learning media proved effective in resolving the problem of low IPAS learning motivation at SD Negeri 279 Palakka in a measurable and sustainable way.

The practical implications of these findings point to the importance of strengthening primary school teachers' competence in managing technology-based classrooms fairly and evenly, rather than simply introducing digital devices

without careful management planning. Yulistiawati et al. (2025) caution that the use of digital technology in learning needs to be balanced with the strengthening of students' critical-thinking skills, so as not to create a counterproductive dependency in the independent learning process. This finding is relevant to the pattern observed in this study, in which the successful application of the digital encyclopedia depended heavily on the balance between students' independent exploration and the teacher's active guidance during the learning process. IPAS teachers at primary school level need to consider the formation of small groups and the proportional scheduling of media access as an integral part of the strategy for applying interactive learning media in the classroom. Saqujuddin (2025) also highlights that contextual and value-based learning approaches contribute to strengthening students' competencies and character development in elementary education.

CONCLUSION

The learning motivation of Year 5 students in the IPAS subject at SD Negeri 279 Palakka, Marioriwawo Subdistrict, Soppeng Regency, underwent a significant positive transformation following the application of interactive, digital-encyclopedia-based learning media. The initial condition of students' learning motivation was classified as very low, as a result of conventional and monotonous daily teaching, characterised by passive attitudes, boredom, and a lack of confidence among students in expressing their opinions. The action intervention, carried out in stages from Cycle I to Cycle II, succeeded in bringing about a genuine improvement in students' affective behaviour, with students demonstrating high enthusiasm, diligence in completing independent tasks, resilience during group discussions, and confidence in solving interactive problems. The increase in classical completeness for learning motivation, from 8% at the pre-action stage to 84% by the end of Cycle II, demonstrates the effectiveness of digital encyclopedia media as a solution to the problem of low IPAS learning motivation in primary schools.

The application of interactive, digital-encyclopedia-based learning media was carried out systematically through eight learning stages, from media conditioning, communication of objectives, and visualisation of material, to viewing guidance, activation of student engagement, discussion and question-and-answer sessions, provision of practice exercises, and evaluation of learning outcomes. The key to the successful application of this medium lay in the improved classroom management carried out by the teacher in Cycle II, particularly through active guidance and a fair, even rotation of media access within small groups. This step proved effective in creating an orderly, conducive,

student-centred learning environment, allowing learning motivation to be maximised and sustained. IPAS teachers are advised to integrate technology-based interactive learning media, such as digital encyclopedias, into daily lessons, particularly for material requiring abstract visual understanding, while future researchers are advised to examine the effectiveness of similar media on other variables, such as students' critical-thinking skills and creativity.

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