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THE EFFECT OF USING TEACHING AT THE RIGHT LEVEL APPROACH WITH AUDIO-VISUAL MEDIA ON IPAS LEARNING OUTCOMES OF FIFTH GRADE STUDENTS AT SD INPRES 5 LOLU

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Article history:
Submitted: Feb. 02nd, 2026; Revised: March 06th, 2026; Accepted: April 10th, 2026; Published: July 12th, 2026

ABSTRACT

This research examines how the Teaching at the Right Level (TaRL) approach, combined with audio-visual media, IPAS learning outcomes among fifth-grade students at SD Inpres 5 Lolu. The primary issue identified was suboptimal academic performance in science, stemming from instruction that failed to accommodate varying student competency levels and limited implementation of engaging instructional resources. A quantitative experimental design was employed, specifically utilizing a one-group pretest-posttest framework. Twenty-one fifth-grade students participated as research subjects, selected through saturated sampling methodology. Assessment was conducted using a validated and reliable multiple-choice instrument designed to measure learning achievement. Statistical analysis incorporated both descriptive methods and the Paired Sample t-Test. Findings revealed a substantial increase in mean scores from 50.37 during the pretest to 83.01 in the posttest. Hypothesis testing yielded a significance value of 0.000 ($p < 0.05$), leading to the rejection of H_0 and acceptance of H_a. Therefore, the research concludes that implementing the TaRL approach with audio-visual support significantly enhances IPAS learning outcomes for fifth-grade students at SD Inpres 5 Lolu.
Keywords: TaRL; audio-visual media; IPAS; learning outcomes

INTRODUCTION

Contemporary educational frameworks in the 21st century emphasize the development of learners who are capable of critical thinking, creative problem-solving, and adaptability to changing circumstances (Rosyida *et al*., 2025). In response to these demands, teachers are required to design learning environments that encourage collaboration and are responsive to students' diverse learning needs (Mardiana *et al*., 2024).

At the elementary school level, learning should focus not only on academic mastery but also on the development of scientific reasoning and social awareness. This principle is reflected in the Natural and Social Sciences (IPAS) subject, which integrates scientific concepts and social perspectives to help students understand natural phenomena and social dynamics in their environment (Zakarina, 2024).

One of the main challenges in IPAS learning lies in the heterogeneity of students' abilities within a single classroom. Conventional teaching practices often apply uniform instructional strategies to all students, regardless of their readiness levels and learning capacities. As a result, students with lower abilities tend to struggle to understand the material, while higher-

achieving students experience limited cognitive stimulation, leading to widened learning gaps (Suharyani *et al*., 2023).

Recent studies indicate that differentiated instruction provides an effective framework for addressing students' diverse learning needs by adapting instructional strategies and learning activities according to learners' readiness levels(Putri & Muldash, 2024). This perspective aligns with the Teaching at the Right Level (TaRL) approach, which groups students based on their actual learning abilities rather than grade level, thereby making instruction more cognitively appropriate and responsive. Furthermore, learning tailored to students' ability levels has been shown to enhance students' motivation and engagement by providing meaningful and achievable learning challenges(Ramdhani *et al*., 2024).

In addition, low IPAS learning outcomes in many elementary schools are influenced by the mismatch between instructional strategies and students' actual learning needs. Learning processes that do not accommodate individual differences often fail to optimize students' potential and engagement (Adenti, 2025).

These challenges are evident at SD Inpres 5 Lolu. Preliminary observations revealed that merely 39% of fifth-grade students met the minimum competency threshold of 75, whereas 61% fell below this benchmark. IPAS instruction continues to rely heavily on conventional lecture-based and interrogative techniques, with inconsistent integration of technology-enhanced learning resources.

The Teaching at the Right Level (TaRL) methodology represents a viable solution to address these educational challenges. Rather than organizing instruction by chronological grade placement, TaRL prioritizes ability-based student clustering according to demonstrated comprehension levels, ensuring instructional adaptation to individual learner requirements (Suharyani *et al*., 2023). Implementation commences with diagnostic evaluation to identify students' current understanding, subsequently establishing dynamic ability-based clusters, while educators deliver differentiated content and learning experiences aligned with each cluster's developmental needs (Sinurat *et al*., 2025). Ability-stratified grouping enables instructors to customize pedagogical interventions matching specific cluster requirements, facilitating comfortable learning within homogeneous ability cohorts that minimize performance anxiety and competency discrepancies (Sinurat *et al.,* 2025). Empirical evidence from Maria Ulviani (2025) demonstrates that TaRL implementation yields substantial improvements in Indonesian language achievement at SDN Taeng, as individualized content alignment enhances both instructional effectiveness and educational equity.

Nevertheless, the effectiveness of the Teaching at the Right Level (TaRL) approach can be significantly enhanced through strategic integration with appropriate instructional media. Audio-visual media combine auditory and visual elements to support students' understanding of abstract concepts, increase attention, and strengthen learning engagement through dynamic and interactive content delivery (Sukmadewi & Suniasih, 2022). Research indicates that audio-visual media enhance cognitive attention and knowledge retention through dual-channel processing, in which simultaneous auditory and visual stimulation strengthens information

encoding into long-term memory. When integrated with TaRL, audio-visual media function not merely as information delivery tools but as cognitive supports that reinforce differentiated instruction based on students' ability levels (Putri & Muldash, 2024). TaRL ensures alignment between learning tasks and students' actual competencies, while audio-visual media enhance conceptual visualization within each learning group, thereby improving instructional relevance and students' learning outcomes (Suharyani *et al*., 2023).

Empirical findings by Azizah and Fatimah (2022) confirm that audio-visual instructional materials significantly facilitate student comprehension while reducing cognitive fatigue, as visually stimulating imagery enhances learner motivation toward content mastery. These multimedia tools effectively clarify abstract theoretical constructs by visualizing phenomena otherwise inaccessible to direct observation. Mulyono (2025) elaborates that such resources enable complex processes to be demonstrated with greater simplicity and realism. According to Piagetian developmental theory cited in Leny Marinda (2024), learners aged 7-11 years function within the concrete operational stage, characterized by logical reasoning about tangible phenomena. Furthermore, synchronized audio-visual presentation captures learner attention and promotes sustained concentration, optimizing cognitive readiness for instruction. Such multimedia integration heightens intellectual curiosity and intrinsic learning motivation, transforming instruction into more enjoyable experiences (Sukmadewi & Suniasih, 2022). Siti Rohmah's research (2025) validates that audio-visual media positively influences IPAS achievement by reinforcing memory consolidation and amplifying student engagement with learning content.

Integrating TaRL methodology with audio-visual resources generates powerful pedagogical synergy within IPAS instruction. TaRL facilitates differentiated instruction calibrated to individual competency levels, whereas audio-visual materials deliver immersive and stimulating learning encounters (Ni'mah *et al*., 2024). The TaRL framework enables educators to modulate curricular content and instructional pacing, while multimedia resources enhance message attractiveness and conceptual transparency (Suharyani *et al*., 2023). Content calibration matching learner proficiency levels ensures each student commences instruction from developmentally appropriate foundations, consequently narrowing achievement disparities. Visual representations incorporating graphics, motion sequences, and auditory elements elucidate theoretical abstractions challenging to observe empirically, including scientific mechanisms and ecological relationships, thus enriching conceptual understanding (Sari, Y., Puspita, F., & Mulyono, 2025). This dual-component integration is anticipated to diminish performance gaps while consolidating comprehensive mastery of IPAS principles.

While existing scholarship has investigated the Teaching at the Right Level approach's efficacy in enhancing academic achievement including Maria Ulviani's (2025) investigation of Indonesian language instruction and Suharyani *et al*.'s (2023) examination of numeracy literacy—these inquiries have not incorporated audio-visual media integration. Conversely, audio-visual media research, exemplified by investigations from Siti Rohmah (2025) and Sukma Dwi Indah (2025), demonstrates

beneficial effects on learning outcomes yet lacks TaRL methodological integration. Consequently, this investigation addresses this scholarly void by exploring how TaRL approach integration with audio-visual media influences IPAS learning achievement among fifth-grade elementary students.

Teaching at the Right Level (TaRL) constitutes an instructional methodology prioritizing learners' demonstrated competencies over chronological grade placement. Initially conceived by Pratham, an Indian educational nonprofit organization, this framework emerged to address educational challenges prevalent in developing nations. TaRL's foundational premise involves organizing students according to comprehension proficiency rather than age-based cohorts, thereby enabling instruction responsive to individual learning requirements. Within TaRL implementation, learners are arranged into compact clusters determined by diagnostic evaluation outcomes measuring fundamental competencies. Educators subsequently deliver differentiated instructional materials and learning activities calibrated to each cluster's proficiency tier. This methodology permits students to progress at individually appropriate rates, eliminating pressures from excessively challenging content while preventing disengagement from overly simplistic material.

Audio-visual media represents instructional resources synthesizing dual primary components auditory elements (sound) and visual components (imagery) to communicate educational information to learners. Sukmadewi and Suniasih (2022) characterize audio-visual media as pedagogical tools employing multisensory aids to elucidate, consolidate, and enhance conceptual comprehension. Core constituents of audio-visual resources encompass visual dimensions (graphics, video recordings, motion graphics) alongside auditory dimensions (vocal narration, musical accompaniment, acoustic effects). Integration of these complementary modalities generates multisensory learning environments capable of intensifying student engagement and cognitive processing. Audio-visual materials manifest as instructional videos, animated sequences, interactive digital simulations, or multimedia compilations that amalgamate diverse elements supporting the educational experience.

Learning outcomes constitute achievements attained by students following instructional participation. Educational theorists define learning outcomes as behavioral transformations manifesting in learners post-instruction, encompassing cognitive, affective, and psychomotor domains. Within IPAS educational contexts, learning outcomes denote students' command of scientific concepts, procedural understanding of scientific inquiry, and practical application of knowledge to real-world situations. Learning achievement can be quantified through diverse assessment methodologies, including written examinations, performance-based observations, or portfolio documentation. Evaluating learning outcomes serves critical functions in determining instructional efficacy and establishing foundations for pedagogical refinement.

Based on this background and *research gap*, this study aims to determine the effect of *the Teaching at the Right Level* (TaRL) approach assisted by audio-visual media on the science learning outcomes of fifth-grade students at SD Inpres 5 Lolu. Specifically, this study examines how

grouping students based on their initial abilities combined with concept visualization through audio-visual media can improve students' understanding of the concept of which is abstract in nature. The results of this study are expected to contribute theoretically to the development of technology-based differentiated learning models, as well as practically in the form of innovative, adaptive learning strategies that are in line with the principles of differentiated learning in the Merdeka Curriculum and support the implementation of Permendikbudristek Number 5 of 2022.

METHOD

This investigation employs a quantitative methodology utilizing a Pre-Experimental Design approach. The research framework implements a One Group Pretest–Posttest Design, incorporating a single research cohort without comparison groups. Participants initially underwent a pretest assessment to establish baseline competencies, with final scores calculated by dividing the obtained score by the maximum possible score and multiplying the result by 100 to obtain percentage-based values. Based on these scores, students were classified into three ability groups: Group 1 (0–59, low ability), Group 2 (60–79, medium ability), and Group 3 (80–100, high ability). Instructional intervention implementing the Teaching at the Right Level (TaRL) methodology supplemented with audio-visual resources was then conducted according to each group's ability level, followed by a posttest evaluation to measure improvements in student learning outcomes (Sugiyono, 2019).

The One Group Pretest-Posttest Design was selected based on constraints regarding available fifth-grade classes at SD Inpres 5 Lolu, comprising solely one classroom. While this design presents constraints in managing extraneous variables, it remains capable of delivering insights regarding the efficacy of the implemented intervention.

Table 1. *One Group Pre-test and Post-test Research Design*

Pre-test	Treatment	Post-test
0_1	X	0_2

Description:

O_1: Initial test (*pretest)*

X: Treatment (TaRL learning assisted by audio-visual media)

O_2: Final test (*posttest*)

The investigation took place at SD Inpres 5 Lolu, located at Jl. Tanjung Tada No.6B, South Lolu, South Palu District, Palu City, Central Sulawesi. Data collection was conducted during the 2025/2026 academic year, specifically in November 2025. The study population consisted of all 21 fifth-grade students enrolled at SD Inpres 5 Lolu, comprising 10 male and 11 female students. A saturated sampling technique was employed, whereby all members of the population were included as research participants. This sample size was considered adequate for a one-group pretest–posttest design, as previous methodological guidelines indicate that small samples ($n \geq 20$) are sufficient to detect moderate intervention effects in within-subject experimental studies using paired statistical analyses (Sugiyono, 2019). Therefore, the inclusion of all 21 students was deemed appropriate for examining the effect of the TaRL approach assisted by audio-visual media on student learning outcomes.

The assessment instrument utilized was a multiple-choice evaluation tool aligned with IPAS grade 5 achievement indicators addressing light properties

content, encompassing cognitive domains C1 (remembering), C2 (understanding), C3 (applying), and C4 (analyzing) (BPMP D.I. Yogyakarta, 2019). Instruments underwent preliminary validity and reliability verification. Pilot testing was executed at SD Inpres 1 Tondo involving 23 students. Validity assessment employing the Pearson Correlation formula with a critical r value of 0.433 demonstrated that among 25 items examined, 19 items satisfied validity criteria. Reliability evaluation utilizing the Cronbach Alpha formula yielded a coefficient of 0.824, confirming instrument reliability and appropriateness for implementation (value > 0.60).

Table 2. Instrument Reliability Test Results

Cronbach Alpha	N of Items
0,824	25

The research protocol commenced with diagnostic evaluation to identify students' baseline competencies. Diagnostic assessment was administered through 10 multiple-choice items addressing prerequisite content on light properties. Students were stratified according to performance scores: Group A (scores 0-40), Group B (scores 41-70), and Group C (scores 71-100). Following assessment outcomes, students were categorized into three proficiency tiers: Group A (low/basic), Group B (medium/intermediate), and Group C (high/advanced) (Aisyah, Thalib, 2025). Subsequently, students completed a pretest, engaged in instruction utilizing the TaRL approach supplemented by audio-visual media across two sessions addressing light properties content, and undertook a posttest as final assessment. Data gathering procedures encompassed learning achievement tests, interviews with educators and students, observation of student engagement throughout instruction as supplementary data (descriptive qualitative), and documentation comprising photographs of activities and instructional materials.

Data analysis procedures employed descriptive and inferential statistical methods utilizing IBM SPSS version 25. Descriptive examination encompassed mean values, minimum scores, maximum scores, and standard deviations to deliver comprehensive insights regarding student learning achievement before and following intervention. Prerequisite testing incorporated normality assessment through the Shapiro-Wilk procedure with normal distribution criteria established when significance values exceed 0.05 (Usmadi, 2020). Hypothesis evaluation implemented the Paired Sample t-Test at a 0.05 significance threshold. Hypothesis testing standards specified that when Sig. (2-tailed) values fell below 0.05, H_0 would be rejected and H_a accepted, signifying substantial effects of implementing the TaRL approach supplemented by audio-visual media on learning outcomes among fifth-grade students at SD Inpres 5 Lolu.

RESULTS AND DISCUSSION

This investigation was executed at SD Inpres 5 Lolu throughout the 2025/2026 academic year involving 21 fifth-grade students as research participants. The investigation sought to establish the influence of implementing the Teaching at the Right Level (TaRL) approach supplemented by audio-visual media on student learning achievement in the IPAS subject addressing light properties.

Descriptive statistical examination revealed variations in student learning achievement enhancement preceding and

following intervention. Mean values for student learning achievement elevated from 50.37 during pretest administration to 83.01 in posttest evaluation. Descriptive analytical findings for pretest and posttest data appear in Table 3.

Table 3. Descriptive Analysis Results of Pretest and Posttest Data

Statistics	*Pretest*	*Posttest*
Sample	21	21
Minimum Score	21,05	68,42
Maximum Score	68,42	94,73
Mean	50,37	83,01
Standard Deviation	14,57	6,28

According to Table 3, students' mean performance on the IPAS pretest registered at 50.37, exhibiting a minimum score of 21.05, maximum score of 68.42, and standard deviation of 14.57. Following intervention utilizing the TaRL approach supplemented by audio-visual media, mean student learning achievement on the posttest elevated to 83.01, demonstrating a minimum score of 68.42, maximum score of 94.73, and standard deviation of 6.28. The reduction in standard deviation magnitude signifies that student learning outcomes following intervention achieved more uniform distribution.

Normality assessment employing the Shapiro-Wilk procedure demonstrated that data exhibited normal distribution patterns with significance values exceeding 0.05. Normality testing outcomes appear in Table 4.

Table 4. Results of Normality Tests for *Pretest* and *Posttest* Data

Learning Outcomes	*Shapiro-Wilk*		
	Statistic	*df*	*Sig.*
Pretest	0,914	21	0,065
Posttest	0,933	*21*	0,159

According to Table 4, pretest data significance values registered at 0.065 while posttest data significance values measured 0.159. Both significance values exceed 0.05 (sig. > 0.05), therefore pretest and posttest learning achievement data demonstrate normal distribution, permitting data analysis advancement to hypothesis evaluation stages. Hypothesis testing outcomes utilizing the Paired Sample t-Test appear in Table 5.

Table 5. Results *of the Paired Sample t-Test*

Paired Differences	*t*	*df*	*Sig.(2-tailed)*
Mean -32,89095	-10,801	*20*	*0,000*
Std. Deviation 13,95533			
Std.Error Mean 3,04530			

According to Table 5, the significance value (Sig. 2-tailed) registered at 0.000. Given the significance value falls below 0.05 (0.000 < 0.05), H_0 is rejected while H_a is accepted. This signifies substantial differences exist between pretest and posttest performance, thereby confirming significant effects from implementing the TaRL approach supplemented by audio-visual media on IPAS learning achievement among fifth-grade students at SD Inpres 5 Lolu.

These findings demonstrate that the implementation of the Teaching at the Right Level (TaRL) approach supported by audio-visual media leads to a meaningful improvement in IPAS learning outcomes among fifth-grade students at SD Inpres 5 Lolu. This demonstrates substantial differences exist between student learning achievement preceding and following TaRL

approach implementation supplemented by audio-visual media.

Mean learning achievement score elevation from 50.37 during pretest to 83.01 in posttest demonstrates that implementing this instructional approach and media yielded favorable effects on student learning achievement. Further analysis based on cognitive domains (C1–C4) reveals that the most substantial improvement occurred in the C2 (understanding) and C3 (applying) domains. Students showed marked progress in explaining concepts of light properties and applying these concepts to simple experimental situations after the intervention. Improvement was also observed in the C1 (remembering) domain, indicating enhanced recall of fundamental concepts, while gains in the C4 (analyzing) domain, although present, were comparatively moderate. This pattern suggests that instruction calibrated to student proficiency levels through the Teaching at the Right Level approach, reinforced by audio-visual media, is particularly effective in strengthening conceptual understanding and procedural application of IPAS content, while higher-order analytical skills require more sustained instructional exposure.

Instruction's initial phase commences with diagnostic evaluation to establish students' baseline competencies. Diagnostic evaluation within the TaRL approach serves critical functions as it enables educators to precisely comprehend individual student learning positions prior to instruction commencement (Ni Made Novi Ayu Asrini *et al*., 2024). Following assessment outcomes, students were stratified into three clusters: Group A (low/basic), Group B (medium/intermediate), and Group C (high/advanced). This stratification permits instruction design aligned with individual student learning requirements. This aligns with perspectives emphasizing that preliminary diagnosis and ability-based clustering in TaRL facilitate students learning at appropriate levels, rendering instructional processes more effective and meaningful.

The Teaching at the Right Level (TaRL) approach enhances learning achievement by focusing instruction on students' actual proficiency levels rather than solely on curricular demands (Suharyani *et al*., 2023). Instruction aligned with students' competency levels reduces cognitive load and encourages confidence and active participation in learning. Learning that is matched to students' readiness levels is theoretically associated with stronger knowledge retention and greater potential for learning transfer, as students construct understanding progressively and meaningfully (Putri & Muldash, 2024).

During the initial session, instruction emphasized fundamental concepts of light properties. Group A explored the concept of light propagation through simplified instructional videos and hands-on experiments, Group B examined light reflection through video presentations, teacher demonstrations, and analysis of everyday examples, while Group C studied light refraction and its applications through instructional videos and guided discussions. The use of real-life contexts and audio-visual visualization supports more sustained understanding and facilitates learning transfer when students encounter similar phenomena in everyday life (Sukmadewi & Suniasih, 2022).

Audio-visual media utilization in instruction performs pivotal functions in content delivery and constitutes significant

factors in enhancing student learning achievement. Audio-visual media enables students to acquire information through dual sensory channels simultaneously auditory and visual thereby optimizing conceptual understanding processes (Afiyana *et al.*, 2024). Within IPAS instruction, numerous concepts remain abstract and challenging to envision through verbal communication alone. Through audio-visual media, these concepts become visualized concretely and contextually (Siti Rohmah, 2025). Research (Sukma Dwi Indah, 2025) indicates that audio-visual media amplifies student motivation and comprehension as it presents content in concrete and engaging formats.

Throughout instructional processes, students complete worksheets calibrated to each cluster's proficiency level. Worksheets function as mechanisms for consolidating concepts and exercising cognitive skills aligned with students' competency tiers. These activities stimulate students toward active participation, discourse, and problem-solving following educator guidance. Observations reveal students demonstrate heightened enthusiasm, active engagement, and willingness to articulate perspectives throughout instructional processes.

Learning achievement enhancement demonstrates that synthesizing the TaRL approach with audio-visual media utilization delivers more meaningful learning experiences for students. The TaRL approach ensures content delivery matches students' competencies, whereas audio-visual media consolidates conceptual comprehension through visualization and engaging presentation formats. Beyond quantitative metrics, qualitative data emerged through educator and student interviews. Interview outcomes reveal students across all clusters perceive instruction as more engaging and comprehensible when supported by audio-visual media. Educators reported that the TaRL approach facilitates more effective classroom management as instruction calibrates to students' competencies.

These investigation outcomes align with research (Suharyani *et al.*, 2023) establishing that the TaRL approach effectively enhances learning achievement through instruction calibrated to students' proficiency levels. Furthermore, studies (Sukma Dwi Indah, 2025) and (Siti Rohmah, 2025) corroborate findings that audio-visual media strengthens conceptual comprehension and learning achievement in science. These findings indicate that the Teaching at the Right Level (TaRL) approach supported by audio-visual media significantly enhances IPAS learning outcomes among fifth-grade students at SD Inpres 5 Lolu. Investigation findings yield practical implications for elementary educators, particularly regarding differentiated instruction implementation. The Teaching at the Right Level approach, enhanced through audio-visual media, offers viable alternative IPAS instructional strategies accommodating student competency variations within individual classrooms. Through proficiency-calibrated instruction supported by engaging media, educators can amplify student participation while reducing learning disparities.

CONCLUSION

Following data analysis and discussion outcomes, IPAS learning achievement among fifth-grade students at SD Inpres 5 Lolu addressing light properties content improved substantially following the implementation of the Teaching at the Right Level (TaRL) approach supplemented

by audio-visual media. The mean pretest performance of 50.37 increased to 83.01 in the posttest, while the reduction in standard deviation from 14.57 to 6.28 indicates that student learning outcomes became more uniformly distributed. The Paired Sample t-Test results demonstrated a significance value of 0.000 ($p < 0.05$), resulting in the rejection of H_0 and acceptance of H_a, thereby confirming the significant effect of the TaRL approach assisted by audio-visual media on students' IPAS learning achievement. Ability-based student stratification through diagnostic assessment enables instruction to be calibrated to individual levels of student comprehension, while audio-visual media facilitates the visualization of abstract concepts through concrete and engaging formats (Mawarti & Siwi, 2025; Viati, 2025). Consequently, these findings reinforce the principles of differentiated learning within the Merdeka Curriculum framework, particularly through competency-based grouping strategies and the utilization of technology-enhanced instructional resources. Despite these positive findings, this study has several limitations, including the use of a one-group pretest–posttest design without a control group, a relatively small sample size, and a short intervention duration that limits conclusions regarding long-term learning retention. Therefore, future research is recommended to employ controlled or randomized experimental designs, involve larger and more diverse samples, incorporate delayed post-tests to examine learning retention, and investigate the implementation of the TaRL approach assisted by audio-visual media across different subject areas, grade levels, and schools with varying levels of readiness in implementing the Merdeka Curriculum.

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