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A Comparison of the SAVI and VAK Learning Models on IPAS Learning Outcomes in Grade 5

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Abstract: This study aimed to compare the learning outcomes of fifth-grade students in Natural and Social Sciences (IPAS) taught using the Somatic, Auditory, Visual, Intellectual (SAVI) learning model and the Visual, Auditory, Kinesthetic (VAK) learning model. This study employed a quantitative approach with a quasi-experimental posttest-only design involving 64 fifth-grade students. The participants consisted of 32 students in the SAVI group and 32 students in the VAK group. Data were collected using a 25-item multiple-choice post-test and analyzed using the Rasch Model with the stacking technique using Winsteps version 4.8.2. The results showed that the mean measure of the SAVI group was 1.49 logits, whereas the VAK group achieved 1.67 logits, indicating a difference of 0.18 logits. Both learning models supported students' IPAS learning outcomes, with the VAK learning model demonstrating a higher mean measure than the SAVI learning model. These findings indicate that the VAK learning model is a promising alternative for supporting student-centered IPAS learning in elementary schools.

Keywords: IPAS learning outcomes; Primary school learning; Quasi-experimental design; SAVI learning model; VAK learning model

Introduction

Education plays a vital role in developing students' knowledge, skills, and character through meaningful learning experiences. In Indonesia, the implementation of the *Merdeka Curriculum* emphasizes student-centered learning to foster creativity, critical thinking, collaboration, and problem-solving skills. One of the curriculum reforms at the elementary school level is integrating Natural Sciences (IPA) and Social Sciences (IPS) into a single subject, namely Natural and Social Sciences (IPAS). This integration is intended to provide contextual and interdisciplinary learning experiences that strengthen students' scientific and social literacy (Narulita et al., 2024). Therefore, selecting appropriate instructional approaches is essential to optimize students' competencies and learning outcomes.

Learning outcomes represent one of the primary indicators of instructional effectiveness because they reflect the knowledge, skills, and attitudes acquired by students after participating in the learning process (Hermanto & Sukmawati, 2025). In IPAS learning, students are expected not only to understand concepts theoretically but also to connect scientific knowledge with real-life situations (Rizki et al., 2025). Previous studies have shown that the use of appropriate instructional models, strategies, and learning media positively influences elementary students' learning outcomes (Kusmawan et al., 2025; Regina & Wulandari, 2025). Consequently, implementing effective student-centered learning models has become increasingly important to improve the quality of IPAS instruction.

However, classroom observations revealed that IPAS instruction in elementary schools still encounters several challenges. The learning process remains dominated by teacher-centered approaches, resulting in limited student participation during classroom activities (Ramadhanti & Sukmawati, 2025; Tsabitah & Sukmawati, 2025). As a consequence, many students experience difficulties in achieving the Learning

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Objective Achievement Criteria (KKTP). These findings are consistent with Hartomo & Sukmawati (2024), who reported that students' low learning outcomes are closely related to limited learning interest and participation. Similarly, Ariyani et al. (2025) emphasized that the lack of innovative instructional models prevents students from achieving optimal learning outcomes.

To address these challenges, instructional models that actively engage students through multiple learning experiences are required. The *Merdeka Curriculum* encourages learning activities that promote conceptual understanding, meaningful learning experiences, and higher-order thinking skills through student-centered instruction (Febianti & Sukmawati, 2024; Oktavia & Sukmawati, 2025; Sinaga et al., 2023). Previous studies have demonstrated that active learning enhances students' critical thinking, creativity, scientific literacy, and problem-solving abilities (Bahriyatin et al., 2024; Irdalisa et al., 2024; Lestari et al., 2024). Therefore, learning models that actively involve students are considered appropriate for overcoming the problems identified during classroom observations.

One instructional model that supports active student participation is the Somatic, Auditory, Visual, Intellectual (SAVI) learning model. This model integrates physical movement, auditory activities, visual observation, and intellectual engagement to facilitate meaningful learning experiences. Through the integration of these four components, students are encouraged not only to receive information but also to analyze, reflect, and solve problems actively. Previous studies have shown that the SAVI learning model improves students' critical thinking skills, learning motivation, creativity, and academic achievement (Khairi & Sukmawati, 2025; Wardani et al., 2023).

Another student-centered learning model that has also been widely implemented is the Visual, Auditory, and Kinesthetic (VAK) learning model. This model accommodates students' learning preferences through visual, auditory, and kinesthetic experiences, thereby creating more engaging learning activities. Although both SAVI and VAK are based on multimodal learning principles, the SAVI model uniquely incorporates an intellectual component that emphasizes reflection, reasoning, and problem-solving, whereas the VAK model primarily focuses on optimizing students' sensory learning experiences through visual, auditory, and kinesthetic modalities. This theoretical distinction provides a strong rationale for comparing the effectiveness of both learning models in improving students' learning outcomes. Previous studies have also reported that the VAK learning model positively influences students' creativity and science learning outcomes in elementary schools (Novianti et al., 2023; Dewi et al., 2023).

Previous studies have consistently demonstrated that innovative student-centered learning models improve elementary students' learning outcomes. However, most existing studies have evaluated the effectiveness of a single instructional model without directly comparing two models that share similar theoretical foundations but differ in their learning characteristics (Wieselmann et al., 2025). Comparative evidence regarding the effectiveness of the SAVI and VAK learning models in IPAS instruction under the implementation of the *Merdeka Curriculum* remains limited, particularly at the elementary school level. Although, Sukmawati et al. (2026) reported that the SAVI learning model significantly improved elementary students' IPAS learning outcomes, comparative studies examining the relative effectiveness of the SAVI and VAK learning models are still scarce. The novelty of this study lies in the direct comparison of the SAVI and VAK learning models using the Rasch Model stacking technique to evaluate fifth-grade students' IPAS learning outcomes. By comparing two learning models with similar multimodal characteristics but different cognitive emphases, this study is expected to provide empirical evidence that supports the selection of effective student-centered instructional models for IPAS learning. Based on this research gap, this study aims to compare the IPAS learning outcomes of fifth-grade students taught using the SAVI learning model and those taught using the VAK learning model.

Method

This study employs a comparative quantitative approach using a quasi-experimental design—specifically a non-equivalent control group design—to determine the differences in IPAS (Natural and Social Sciences) learning outcomes between fifth-grade students taught using the SAVI (Somatic, Auditory, Visual, Intellectual) model and those taught using the VAK (Visual, Auditory, Kinesthetic) model. The research was conducted at SDN Warakas 03, involving two experimental classes: Class V-A, which utilized the SAVI model, and Class V-B, which utilized the VAK model. This design was selected because the researcher did not randomize the subjects but instead utilized classes pre-assigned by the school (Arrauyani & Sukmawati, 2025). Data collection was carried out using a multiple-choice IPAS learning outcome test administered after the instructional intervention. Data analysis utilized the Rasch Model approach to evaluate the quality of the research instrument and assess student abilities with greater objectivity, accuracy, and depth, thereby revealing differences in learning outcomes between the two groups based on the effectiveness of the

respective learning models (Fauziah & Sukmawati, 2023). The research design can be described as follows.

O^1	X	O^2
O^3	X^1	O^4

Figure 1. Research design

The study was conducted at SDN Warakas 03, North Jakarta, during the even semester of the 2025/2026 academic year. The study population consisted of all Grade V students, comprising two classes with a total of 64 students. A saturated sampling technique was employed, meaning the entire population served as the research sample (Waruru, 2024).

Table 1. Research sample

Class	Number of Student	Description	Model
V-A	32	Experimental Class	SAVI
V-B	32	Experimental Class	VAK

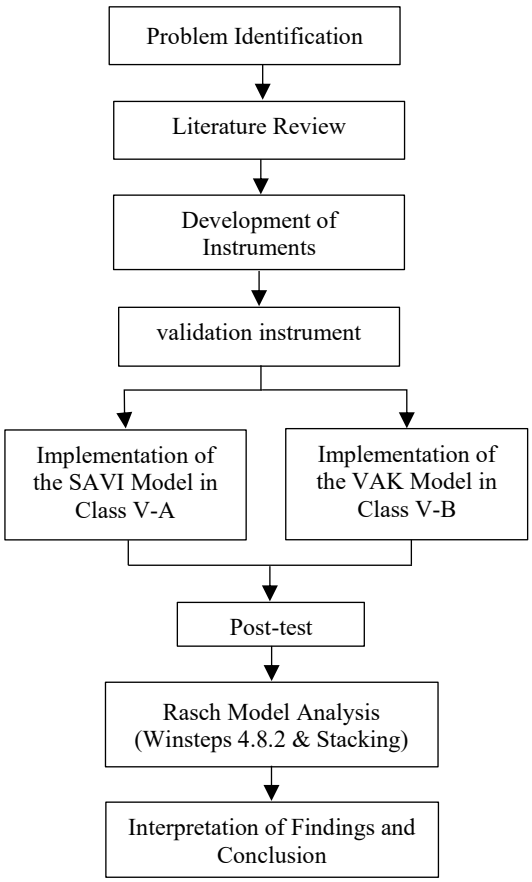

Figure 2. Research procedure flowchart

Class V-A served as the group receiving instruction via the SAVI learning model, while Class V-B served as the group receiving instruction via the VAK learning model. The implementation of the SAVI and VAK models in teaching the human digestive system within the experimental classes is illustrated in Figure 2.

Figure 2 illustrates the overall research procedure. The study began with determining the research population and selecting participants using a saturated sampling technique. The two experimental classes then received instruction using the SAVI and VAK learning models, followed by the administration of a post-test. The collected data were analyzed using the Rasch Model through Winsteps version 4.8.2, and stacking analysis was performed to compare students' learning outcomes between the two learning models (Abdalla et al., 2026).

Figure 3. Implementation of SAVI and VAK learning models in human digestive system instruction in the experimental class

The research instrument consisted of a 25-item multiple-choice test designed based on indicators of conceptual understanding regarding the human digestive system. The instrument's development was guided by learning objectives and indicators covering conceptual understanding, the ability to identify digestive organ functions, the analysis of digestive mechanisms, and the application of concepts to real-life situations (Sugitri & Fitri, 2022; Septiani & Sukmawati, 2025). The instrument was developed in alignment with elementary school learning outcomes for Natural and Social Sciences (IPAS), specifically focusing on understanding concepts, identifying digestive organ functions, and analyzing the human digestive process.

Data collection involved administering a post-test to students who had participated in instruction using either the SAVI or VAK models. The test was administered to determine differences in IPAS learning outcomes between the groups following their respective instructional treatments.

The data were analyzed using the Rasch Model approach with the aid of Winsteps software (version 4.8.2). Rasch analysis was employed to evaluate the quality of the research instrument based on metrics such as person reliability, item reliability, person separation, item separation, item difficulty levels, and the fit of items and respondents to the measurement model, thereby ensuring more objective and accurate measurement results (Anwar et al., 2024). Furthermore, the Rasch

Model can be utilized to evaluate instrument quality, identify student proficiency levels, and assess the fit of the data to the measurement model (Fitria & Sukmawati, 2024).

The item fit criteria in this study are based on INFIT MNSQ and OUTFIT MNSQ values, with an ideal range of 0.5–1.5. Furthermore, Rasch analysis was employed to assess student ability via person measure (logit) values; these were then compared between the SAVI and VAK groups to identify potential differences in learning outcomes regarding the human digestive system (Aziz et al., 2023).

Additionally, this study utilized a stacking technique to analyze changes in student ability based on post-test results. The stacking technique allows for a detailed observation of changes in individual measure values, thereby illustrating the improvement in student ability following instruction. The analysis results were subsequently used to evaluate the effectiveness of the SAVI and VAK learning models in fostering an understanding of human digestive system concepts.

Results and Discussion

The Rasch Model analysis was conducted using Winsteps version 4.8.2 to evaluate students' learning outcomes after receiving instruction through the SAVI and VAK learning models. The analysis generated several measurement indicators, including person reliability, person separation, item reliability, item separation, and mean person measure. The measurement summary is presented in Table 2.

Table 2. Research model statistical summary

Indicator	Value
Number of Respondent	64
Number of Items	25
Mean Measure Person	1.58
Person Reliability	0.71
Person Separation	1.57
Item Reliability	0.89
Item Separation	2.91

Based on Table 2, the person reliability value of 0.71 indicates good consistency in measuring students' abilities. Furthermore, the person separation value of 1.57 suggests that the instrument classified students into approximately two ability strata, representing relatively higher and lower ability groups. Meanwhile, the item reliability value of 0.99 and item separation value of 2.91 indicate excellent item quality and the ability to distinguish item difficulty levels consistently. The mean person measure of 1.58 logits indicates that, on average, students demonstrated abilities above the average item difficulty level.

Table 3. Comparison of learning outcomes between SAVI and VAK groups

Group	Number of Student	Mean Measure (Logit)
SAVI	32	1.49
VAK	32	1.67

Based on Table 3, students in the SAVI group obtained a mean measure of 1.49 logits, whereas students in the VAK group achieved 1.67 logits. The descriptive difference between both groups was 0.18 logits, indicating that the VAK group obtained a slightly higher mean measure than the SAVI group.

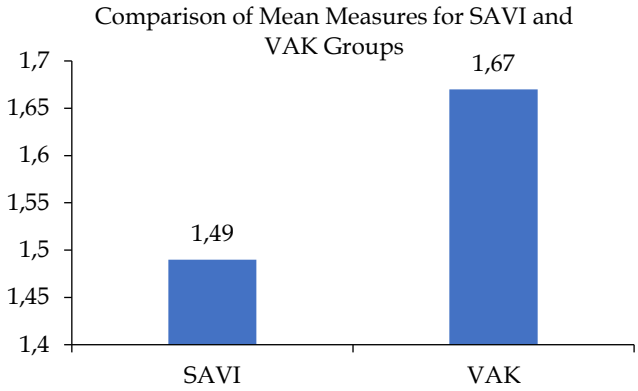

Figure 4. Comparison of mean measures for SAVI and VAK groups

Figure 4 clarifies the results presented in Table 2, showing that the VAK group achieved a higher mean measure value than the SAVI group. This difference indicates that students taught using the VAK model demonstrated slightly better proficiency in solving IPAS (Natural and Social Sciences) problems compared to those taught using the SAVI model. The research findings demonstrate that both learning models effectively enhanced students' understanding of the human digestive system. This is evidenced by mean measure values exceeding the logit midpoint, indicating that the majority of students had a high probability of correctly answering test items relative to their difficulty levels. From the perspective of the Rasch Model, this suggests that the implemented instructional process provided an adequate learning experience, resulting in student proficiency levels that surpassed the instrument's average difficulty. These findings align with research by Sari et al. (2023), which explains that active learning improves students' conceptual mastery through direct engagement during the learning process.

The implementation of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model actively engaged students through physical activities, listening, visual observation, and intellectual tasks during the learning process. Students participated in discussions, observed learning materials, expressed ideas, and

solved problems collaboratively. These learning activities encouraged active participation and supported students in developing a deeper understanding of the human digestive system concepts.

Figure 5. Implementation of the SAVI learning model during IPAS learning

Figure 6. Implementation of the VAK learning model during IPAS learning

The implementation of the VAK (Visual, Auditory, Kinesthetic) learning model during IPAS instruction. Students actively participated in learning activities through visual observation, listening, and kinesthetic experiences designed to accommodate different learning styles. These activities created an interactive learning environment and enabled students to construct their understanding of the human digestive system through direct learning experiences (Aboudonya et al., 2025; Sayed et al., 2025).

Beyond reflecting student proficiency, the Rasch analysis indicates that the instrument possessed high measurement quality. The person reliability value suggests relatively consistent student responses, while the item reliability value indicates that the test items were capable of adequately discriminating between students' proficiency levels (Putri & Sukmawati, 2024). These results provide confidence that the difference in learning outcomes between the SAVI and VAK groups stemmed from variations in student proficiency following instruction, rather than from poor instrument quality. This conclusion is supported by Sukmawati & Wahjusaputri (2024), who state that instruments with high reliability yield more accurate measurements of proficiency.

A comparison of learning outcomes indicates that the group taught using the VAK model achieved a higher mean measure than the SAVI group. Although the difference was only 0.18 logits, the results suggest a tendency for students in the VAK group to more easily solve problems of equal difficulty (Prihatini, 2017). In Rasch analysis, logit differences reflect relatively consistent variations in ability, making them a valid basis for comparing the effectiveness of the two learning models. These findings align with research by Ifdaniyah & Sukmawati (2024) regarding the enhancement of student abilities through instruction that incorporates multiple learning modalities.

The superiority of the VAK model is likely linked to its instructional characteristics, which optimize three learning modalities: visual, auditory, and kinesthetic. Combining these modalities allows students to receive information through multiple sensory channels, thereby making the process of conceptual understanding more effective (Ramos-Galarza et al., 2025). Regarding the topic of the human digestive system, the use of organ visualizations, teacher explanations, and hands-on learning activities provides complementary learning experiences that facilitate easier comprehension of concepts. This aligns with findings by Febianti & Sukmawati (2024), which demonstrate that the use of visual media and hands-on activities can improve science concept understanding among elementary school students.

In addition to the characteristics of the learning model, the nature of the subject matter is also believed to have influenced the study's results (Jegstad et al., 2025). The human digestive system involves concrete concepts that are more easily understood when students have the opportunity to observe images, organ models, or simulations of the digestive process (Armadhani et al., 2025). Learning experiences involving direct observation and activity help students establish connections between the concepts being studied and phenomena encountered in their daily lives. These findings are supported by research from Izzati & Sukmawati (2024), which explains that concrete learning media can enhance learning outcomes in integrated science and social studies (IPAS) for elementary school students.

Although the VAK model yielded higher average scores, the SAVI model also demonstrated positive results. This indicates that integrating somatic, auditory, visual, and intellectual elements contributes to improved student learning outcomes (Peters et al., 2025). Incorporating physical activity alongside cognitive processes allows students to build a deeper understanding. Consequently, SAVI remains an effective alternative instructional model for IPAS (Natural and Social Sciences) education. These results

align with research by Sukmawati et al. (2022), which shows that instruction integrating physical and] intellectual activities enhances students' conceptual understanding.

The relatively small difference in results between the two groups suggests that both models are equally capable of fostering student-centered learning. This indicates that both SAVI and VAK possess characteristics that support the implementation of the "Kurikulum Merdeka" (Independent Curriculum) by providing students with opportunities to explore knowledge through diverse learning activities (Koivuhovi et al., 2025; Kurtulmus & Sulun, 2026). Therefore, the choice of instructional model should be tailored to the characteristics of the subject matter, learning objectives, and student needs. These findings support research by Sukmawati & Wahjusaputri (2024), which emphasizes that successful learning depends not only on the model employed but also on the model's alignment with the material's characteristics.

From the perspective of the Rasch Model, the VAK group's advantage is evident not only in higher average ability scores but also in the students' performance on test items of varying difficulty levels. Students in the VAK group were more likely to successfully answer questions exceeding the average difficulty level compared to those in the SAVI group. This demonstrates that multisensory learning experiences contribute to enhancing students' conceptual abilities. These results are supported by research from Maya & Sukmawati (2023), which states that instruction incorporating diverse learning experiences can improve both scientific literacy and learning outcomes.

The implications of this study suggest that elementary school teachers should consider using instructional models capable of accommodating students' diverse learning styles. The VAK model serves as a primary alternative when the subject matter requires extensive visualization and concrete activities, whereas the SAVI model is suitable for content demanding deeper cognitive engagement. Thus, both models play a vital role in enhancing the quality of IPAS (Natural and Social Sciences) instruction in elementary schools. These findings align with research by Sukmawati et al. (2025) regarding the importance of innovative instruction in boosting students' learning outcomes and scientific literacy.

Conclusion

This study concludes that there is a significant difference in IPAS learning outcomes between students taught using the SAVI learning model and those taught using the VAK learning model. The VAK learning model was found to be more effective in improving students' learning outcomes on the topic of the human digestive system. These findings indicate that the VAK model can serve as an alternative instructional approach for elementary school teachers to support more effective and meaningful IPAS learning. Future research is recommended to involve larger and more diverse samples, explore different learning topics, and examine the long-term effectiveness of both learning models in various educational contexts.

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Author Contributions

Conceptualization, methodology, formal analysis, investigation, resources, data curation, writing—original draft preparation, A.R.A.R.; validation, writing—review and editing, visualization, project administration, I.Y. The author has read and approved the published version of the manuscript.

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Conflicts of Interest

The author declares no conflict of interest regarding this study. The author also declares the absence of any personal relationships or other interests that could influence the conduct of the research, data analysis, interpretation of results, or the preparation of this manuscript.

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