



DEVELOPMENT OF INTERACTIVE INSTRUCTIONAL MATERIALS BASED ON THE SAVI MODEL USING THE ADDIE DESIGN IN THE INTRODUCTION TO COMPUTERS COURSE

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Received: 2025-08-13 Accepted: 2025-11-15 Published: 2025-12-21

Abstrak

Perkembangan teknologi dan keragaman gaya belajar mahasiswa menuntut adanya inovasi bahan ajar yang mampu menghadirkan pengalaman belajar yang interaktif dan adaptif terhadap kebutuhan pengguna. Penelitian ini bertujuan mengembangkan bahan ajar interaktif berbasis model SAVI (Somatic, Auditory, Visual, Intellectual) dengan kerangka kerja ADDIE pada mata kuliah Pengenalan Komputer. Pendekatan SAVI dipilih untuk mengintegrasikan aktivitas fisik, pendengaran, penglihatan, dan penalaran dalam proses pembelajaran, sehingga mahasiswa dapat belajar secara aktif melalui pengalaman yang menyeluruh. Proses pengembangan melibatkan dua validator materi, dua validator media, dan dua puluh mahasiswa sebagai peserta uji coba. Data dikumpulkan melalui angket validasi dan respons pengguna yang dianalisis menggunakan skala Likert untuk menilai tingkat kelayakan bahan ajar. Hasil penelitian menunjukkan bahwa bahan ajar memperoleh skor rata-rata 4,6 pada aspek materi, 4,4 pada aspek media, dan 4,3 pada respons mahasiswa, seluruhnya termasuk dalam kategori "Sangat Layak." Temuan ini memperlihatkan bahwa integrasi model SAVI dan teori multimodal learning dapat meningkatkan keterlibatan mahasiswa dan memperkuat pemahaman konsep melalui media pembelajaran yang menarik, mudah digunakan, serta sesuai dengan karakteristik pembelajaran digital di perguruan tinggi masa kini.

Kata kunci: ADDIE, SAVI, Interactive Media, Multimodal Learning, Pengenalan Komputer.

Abstract

The rapid advancement of technology and the diversity of students' learning styles necessitate innovative instructional materials that can provide interactive and adaptive learning experiences tailored to users' needs. This study aims to develop interactive instructional materials based on the SAVI (Somatic, Auditory, Visual, Intellectual) learning model using the ADDIE framework for the Introduction to Computers course. The SAVI approach was selected to integrate physical activity, auditory input, visual representation, and intellectual reasoning within the learning process, enabling students to engage actively through holistic learning experiences. The development process involved two subject-matter experts, two media experts, and twenty undergraduate students as trial participants. Data were collected through validation questionnaires and user response surveys, which were analyzed using a Likert scale to assess the feasibility of the instructional materials. The results indicate that the materials achieved an average score of 4.6 for content quality, 4.4 for media design, and 4.3 for student responses, all of which fall into the "Highly Feasible" category. These findings demonstrate that integrating the SAVI model with multimodal learning theory can enhance student engagement and strengthen conceptual understanding through instructional media that are engaging, user-friendly, and aligned with the characteristics of contemporary digital learning in higher education.

Keywords: ADDIE, SAVI, Interactive Media, Multimodal Learning, Computer Introduction



How to cite (in APA style): Bayunanda, E., & Andhika, A. R. (2025). Development of interactive instructional materials based on the SAVI model using the ADDIE design in the introduction to computers course. *Jurnal Pendidikan Informatika Dan Sains*, 14(2), 214–224. <https://doi.org/10.31571/saintek.v14i2.9479>

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DOI: 10.31571/saintek.v14i2.9479

INTRODUCTION

The Introduction to Computers course is one of the fundamental subjects that plays a strategic role in higher education, particularly in the field of information technology. This course serves as a foundation for students to understand basic computer concepts, digital technologies, and essential skills required to keep pace with rapidly evolving technological developments. However, instructional practices that are still predominantly based on conventional approaches tend to inadequately accommodate the diversity of students' learning styles. This condition has implications for low learning motivation and suboptimal conceptual understanding, particularly for abstract and applied concepts (Amri et al., 2024). Therefore, innovative instructional materials that are more interactive, adaptive, and flexible are needed to ensure that the learning process becomes more effective (Abdul Sakti, 2023).

The development of interactive instructional materials represents a relevant alternative solution to address these challenges. In this context, the integration of appropriate learning models and development frameworks is a critical factor in producing high-quality instructional materials. The SAVI (Somatic, Auditory, Visual, Intellectual) learning model offers a multimodal approach that emphasizes the simultaneous engagement of physical activities, auditory input, visual representation, and cognitive processing, thereby accommodating diverse student learning styles (Abdi et al., 2020). Meanwhile, the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation) provides a systematic framework for designing, developing, and evaluating instructional materials to ensure alignment with learning needs and the demands of 21st-century competencies (Danny, 2024; Awaluddin et al., 2025).

Several previous studies have demonstrated that the development of digital and interactive instructional materials has a positive impact on learning quality. Anwar (2024) reported that the development of Canva-based digital instructional materials using the ADDIE model for procedural text content resulted in products that were highly feasible and effective, and significantly enhanced students' interest and understanding. Another study by Putra et al. (2023) found that the use of interactive media such as Scratch in programming instruction significantly improved students' motivation and conceptual understanding. These findings reinforce the potential of interactive media as effective support tools for computer-related learning.

From the perspective of instructional approaches, numerous studies have also confirmed the effectiveness of the SAVI model in improving learning outcomes and conceptual understanding. Mukarromah et al. (2025a) found that the implementation of the SAVI model was significantly more effective than conventional instruction in enhancing science learning outcomes. Research by Eriawan and Putra (2025) showed that integrating the SAVI model with digital media such as Canva led to more optimal improvements in elementary students' conceptual understanding. Furthermore, studies by Darama et al. (2025) and Jum' et al. (2021) reported that SAVI-based learning effectively enhanced science process skills, student activeness, motivation, and interaction through learning approaches that engage multiple senses and learning activities.

Despite the demonstrated effectiveness of the SAVI model and the ADDIE framework when applied independently, studies that specifically integrate both models in the development of interactive instructional materials for the Introduction to Computers course in higher education

remain relatively limited. Most previous research has focused on primary and secondary education levels or on non-computing subjects. Consequently, a research gap exists concerning the development of SAVI-based interactive instructional materials using the ADDIE framework that are specifically designed for the higher education context.

Based on the foregoing discussion, this study aims to develop interactive instructional materials for the Introduction to Computers course by integrating the SAVI learning model with the ADDIE development framework. This development is directed toward producing instructional materials that are valid, practical, and effective in enhancing student engagement, motivation, and conceptual understanding. The novelty of this study lies in the systematic integration of the SAVI and ADDIE models in the development of interactive instructional materials in higher education, which is expected to serve as both a conceptual and practical reference for the development of innovative instructional materials in related courses.

METHOD

Research Design

This study employed a research and development (R&D) approach aimed at producing interactive instructional materials for the Introduction to Computers course. The development model used was ADDIE (Analysis, Design, Development, Implementation, Evaluation), while the instructional approach applied in designing the content was the SAVI (Somatic, Auditory, Visual, Intellectual) learning model. The integration of these two models was intended to produce instructional materials that are systematic, interactive, and capable of accommodating the diversity of students' learning styles.

SAVI Learning Approach

The SAVI approach emphasizes the engagement of multiple learning modalities through somatic, auditory, visual, and intellectual activities. This approach was selected because it facilitates more active, meaningful, and student-centered learning, while simultaneously promoting the development of higher-order thinking and problem-solving skills (Syifa Kamilah Sophian et al., 2025). In the development of the instructional materials, SAVI principles were implemented through a combination of interactive simulations, audio-based narration or explanations, visual representations such as images and animations, and intellectual activities including quizzes and analytical exercises (Aprilyanti et al., 2025). The application of this approach is expected to enhance student engagement throughout the learning process and support deeper conceptual understanding.

ADDIE Development Model

The ADDIE model was used as a systematic framework for developing the interactive instructional materials. This model consists of five interrelated stages—analysis, design, development, implementation, and evaluation—which are carried out sequentially and iteratively (Tu et al., 2021). Each stage was implemented in alignment with SAVI principles as the foundation for designing learning activities.

Analysis Stage

The analysis stage aimed to identify learning needs and instructional problems in the Introduction to Computers course. Activities at this stage included a needs analysis to identify gaps between conventional instruction and technology-based interactive learning, an analysis of student characteristics encompassing variations in learning styles (visual, auditory, and kinesthetic), and an analysis of the curriculum and course learning outcomes (CPMK). The results indicated that students require instructional materials that are visual, interactive, and supportive of hands-on activities and critical thinking, in line with the somatic and intellectual components of the SAVI model.

Design Stage

The design stage focused on planning the structure, visual layout, and interaction mechanisms of the interactive instructional materials. Activities included the development of storyboards and flowcharts to illustrate navigation flow between pages, the selection of Microsoft PowerPoint as the instructional media format incorporating text, images, animations, audio, and video, and the design of SAVI-based learning activities. Each instructional unit was designed to include somatic elements (observation or exploration activities), auditory elements (audio narration or explanations), visual elements (diagrams and illustrations), and intellectual elements (analytical exercises and quizzes). This stage resulted in an initial prototype of the interactive instructional materials ready for development.

Development Stage

During the development stage, the designed prototype was transformed into digital interactive instructional materials using Microsoft PowerPoint. The development process involved content construction, integration of multimedia elements, and embedding SAVI-based learning activities within each module. The resulting product was subsequently validated by two subject-matter experts and two media experts to assess content accuracy, visual design, and technical aspects. Validation feedback served as the basis for revising the materials to ensure that the final product met high feasibility standards.

Implementation Stage

The implementation stage was conducted to examine the practicality and effectiveness of the interactive instructional materials in an authentic learning context. A limited trial was carried out involving 20 first-semester students from the Informatics Study Program and two lecturers teaching the Introduction to Computers course at Universitas PGRI Pontianak. Students used the instructional materials during both independent learning activities and lecturer-guided sessions. Data were collected through user response questionnaires and observations to assess student engagement, ease of use, content clarity, visual appeal, and the impact of the materials on conceptual understanding and learning motivation.

Evaluation Stage

The evaluation stage aimed to assess the success of the interactive instructional materials from both process and outcome perspectives. Evaluation was conducted through formative evaluation at each ADDIE stage to refine the product based on expert feedback and limited trial results, as well as summative evaluation after the implementation stage to determine the overall effectiveness of the materials. The final evaluation focused on product feasibility, covering validity, practicality, and effectiveness—and on the implementation of SAVI principles as reflected in student engagement across somatic, auditory, visual, and intellectual dimensions.

RESULT AND DISCUSSION

This study resulted in the development of interactive instructional materials based on the SAVI (Somatic, Auditory, Visual, Intellectual) learning model, developed using the ADDIE approach. The development outcomes are presented according to the five main stages of the ADDIE model: analysis, design, development, implementation, and evaluation. Each stage generated empirical findings that reflect both the developmental process and the tangible outcomes of the study.

The development process began with the realization of the design produced during the design stage. Once the design was completed, the process proceeded to the implementation stage, which involved testing the feasibility of the developed instructional materials (Budiarta et al., 2016). This trial involved both lecturers and students as research participants to obtain valid and constructive feedback. The final stage of the study consisted of conducting a comprehensive evaluation of all

stages within the ADDIE model and drawing conclusions regarding the feasibility level of the developed product based on the results of the testing process.

This study employed two types of data: qualitative and quantitative. Qualitative data were obtained from feedback in the form of recommendations and opinions provided by expert validators and trial participants. Meanwhile, quantitative data were collected through scores derived from validation questionnaires completed by experts and research trial subjects (Hardani et al., 2020). The measurement instrument used was based on a Likert scale. Subsequently, the numerical scores on the scale were transformed into qualitative categories to provide a clearer representation of the validity level of the developed instructional materials. Table 1 presents the criteria and scoring scheme applied in the Likert scale.

Table 1. Likert Scale

Score	Criteria
5	Very Good
4	Good
3	Fair
2	Poor
1	Very Poor

Source: Soulisa et al. (2022)

Data collection in this study was conducted using questionnaires. The developed instructional materials were tested on 20 first-semester students from the Informatics Study Program and two lecturers teaching the Introduction to Computers course. In the data analysis process, item-level scoring and overall score calculations were applied. The feasibility criteria for the developed instructional materials are presented in Table 2, while the practicality criteria are shown in Table 3.

Table 2. Feasibility Criteria of Instructional Materials

Mean Score Range	Classification
4.21 – 5.00	Highly Feasible
3.41 – 4.20	Feasible
2.61 – 3.40	Fair
1.81 – 2.60	Not Feasible
1.00 – 1.80	Highly Not Feasible

Source: Antonov Purba & Verawardina (2021)

Table 3. Practicality Criteria of Instructional Materials

Mean Score Range	Classification
4.21 – 5.00	Highly Practical
3.41 – 4.20	Practical
2.61 – 3.40	Fair
1.81 – 2.60	Not Practical
1.00 – 1.80	Highly Not Practical

Source: Garay Abad & Hattie (2025)

Analysis Stage

The analysis stage was conducted to determine the instructional material development needs in order to ensure alignment with the curriculum and fulfillment of basic competencies and learning

objectives. This stage involved mapping the gap between existing instructional conditions and the expected learning outcomes, as well as identifying students' characteristics and learning needs (Hidayah et al., 2023). Based on interviews with two lecturers teaching the Introduction to Computers course and questionnaire responses from 20 first-semester students of the Informatics Study Program, it was found that learning activities were still predominantly lecturer-centered with minimal digital interaction. The instructional content tended to be theoretical in nature, with limited visualization and less engaging practical activities, resulting in low student motivation and insufficient understanding of basic computer concepts.

The analysis results also indicated that students exhibit diverse learning styles, with some students better understanding content through visual representations, while others benefit more from hands-on practice or audio-based explanations. Therefore, PowerPoint-based instructional materials were developed using the SAVI (Somatic, Auditory, Visual, Intellectual) approach to accommodate these variations in learning styles. The application was designed to be visually rich, incorporating images, illustrations, and interactive activities that integrate simulations, audio narration, and thinking exercises (Nurhasanah et al., 2022). The SAVI approach is expected to enhance students' active engagement and strengthen conceptual understanding through more engaging and holistic learning experiences.

Design Stage

Based on the results of the needs analysis, the design stage focused on developing the conceptual framework, content structure, and visual layout of the instructional materials in accordance with user characteristics. The product design was realized through storyboards and flowcharts that illustrate navigation flow, the sequence of content presentation, and inter-page integration. The storyboard consisted of three main components: (1) an opening page and navigation menu, (2) content pages containing text, images, and explanatory videos, and (3) practice pages featuring interactive quizzes. This design aimed to ensure systematic content delivery while creating a structured and engaging learning experience.

In addition, the design stage included mapping the implementation of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model within each learning activity. The somatic element was accommodated through exploration and observation activities related to computer hardware components; the auditory element through audio narration and video presentations; the visual element through the use of illustrations, infographics, and animations; and the intellectual element through critical thinking exercises and reflective activities following the learning content. The outcome of this stage was a communicative, interactive, and visually appealing instructional material design that is easy to use as a self-learning guide for students. The SAVI indicators applied in this study are presented in Table 4.

Table 4. SAVI Indicators Implemented in the Instructional Materials

Content Area	SAVI Indicators
Somatic	Observation of computer hardware components
Auditory	Video and audio presentations embedded in the instructional materials
Visual	Use of images and visual representations related to the content
Intellectual	Discussion and critical thinking activities based on the instructional materials

Development Stage

The development stage represents the process of transforming the design into a concrete interactive learning product. At this stage, the researcher implemented the design outcomes into systematic and interactive PowerPoint-based digital instructional materials. The development process

included the creation of textual content, visual illustrations, interactive navigation, and the integration of multimedia elements such as audio, video, and quizzes. All components were designed to accommodate the SAVI elements (Somatic, Auditory, Visual, and Intellectual), enabling students to learn through direct experience, auditory explanations, visual observation, and analytical as well as reflective engagement with the learning materials.

The development process began with structuring module content based on the results of the needs analysis and storyboard design. Each module covered different topics within the Introduction to Computers course, such as computer hardware, software, and ethical issues in technology use. The instructional materials were designed with appealing visuals, intuitive navigation icons, and supportive sound effects to enhance comprehension. The main menu served as the entry point that allowed students to select learning topics and explore the materials independently, thereby encouraging active engagement in accordance with individual learning styles.



Figure 1. Initial Display of the Interactive Instructional Materials

Figure 1 presents the main interface of the interactive instructional materials, which functions as the menu or home page. This page allows students to select learning modules, such as hardware introduction, software introduction, and evaluation exercises. The SAVI components accommodated include the visual aspect through an engaging layout and navigation icons, the auditory aspect through narration and supporting sound effects, and the intellectual aspect through exploratory activities that foster independent learning. Students initiate learning by selecting topics and following the interactive flow according to their respective learning preferences.

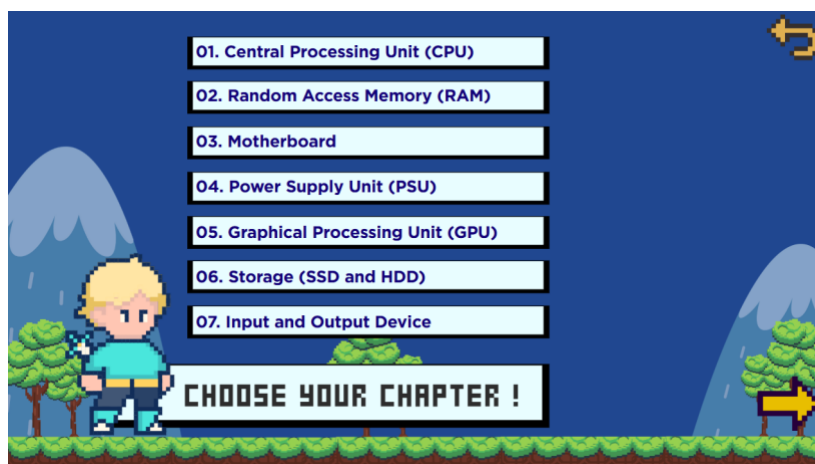


Figure 2. Learning Content Display

Figure 2 illustrates the core learning content, which consists of text, images of computer hardware, and links to interactive videos that integrate the SAVI aspects (Somatic, Auditory, Visual, and Intellectual). The somatic aspect is realized through direct observation or interactive simulations, the auditory aspect through narrated explanations, and the visual aspect through supporting illustrations and animations. The intellectual aspect is developed through reflective questions and practice exercises designed to promote critical thinking. Students can read, listen to, and interact with the content according to their learning styles, making the learning process more active and interactive.

Table 5. Media Validation Results

Research Instrument	Validator 1	Validator 2	Mean Score	Criteria
Content	4.55	4.2	4.38	Highly Feasible
Media	4.45	4.1	4.28	Highly Feasible

Table 5 presents the validation results conducted by two validators on the content and media aspects of the SAVI-based interactive instructional materials. Based on the validation results, the content aspect obtained a score of 4.55 from Validator 1 and 4.20 from Validator 2, with a mean score of 4.38. This score falls into the Highly Feasible category, indicating that the instructional content meets high feasibility standards in terms of conceptual accuracy, alignment with learning outcomes, and relevance to students' needs. In addition, the content was considered well-structured, easy to understand, and capable of accommodating intellectual and visual elements in line with the characteristics of the SAVI model through the use of images, illustrations, and reflective exercises.

For the media aspect, scores of 4.45 and 4.10 were obtained from Validator 1 and Validator 2, respectively, with a mean score of 4.28. This result is also categorized as Highly Feasible, indicating that the visual design, interactive navigation, and multimedia integration (text, images, animations, and audio) function effectively. Validators noted that the choice of colors, layout, and interactive features such as navigation buttons and transition animations were able to attract students' attention and support the implementation of somatic, auditory, and visual learning principles as emphasized in the SAVI model.

Table 6. Practicality of Lecturer and Student Response Questionnaires

Aspect	Mean Score	Criteria
Lecturers	4.5	Highly Practical
Students	4.2	Practical
Overall Mean	4.35	Highly Practical

Table 6 presents the analysis of the practicality of the SAVI-based interactive instructional materials, obtained from evaluations by lecturers and students following the implementation stage. The purpose of this assessment was to measure ease of use, efficiency in supporting the learning process, and the ability of the materials to facilitate interactive and independent learning activities. Based on the analysis, lecturers provided a mean score of 4.50, classified as Highly Practical. This result indicates that the developed instructional materials effectively meet instructional needs from the educators' perspective. Lecturers reported that the navigation and user interface were easy to operate, the material structure was systematically organized, and interactive features such as quizzes, videos, and navigation buttons functioned well in supporting the delivery of basic computer concepts.

Meanwhile, student evaluations yielded a mean score of 4.20, categorized as Practical, indicating that the instructional materials were easy to use, engaging, and relevant to students' learning needs. Students reported that the materials facilitated comprehensive understanding through the application of somatic elements (hands-on activities), auditory elements (audio narration), visual

elements (images and animations), and intellectual elements (practice questions and conceptual reflection). Overall, the combined mean score from lecturers and students was 4.35, which falls into the Highly Practical category. These findings indicate that the SAVI-based interactive instructional materials are not only feasible in terms of content and design but also demonstrate a high level of practicality for implementation in higher education learning environments.

Evaluation

The evaluation results indicate that the SAVI-based interactive instructional materials achieved a content validation score of 4.6, a media validation score of 4.4, and a student response score of 4.3, all of which fall within the Highly Feasible category. The high score obtained for the content aspect reflects strong alignment between the instructional materials and the intended learning outcomes, as well as the effective incorporation of the intellectual component of the SAVI model that encourages critical thinking among students. The high score for the media aspect demonstrates the effective application of visual and auditory principles, consistent with Mayer's Multimedia Learning Theory, particularly the signaling and coherence principles, which emphasize clarity of presentation and the integration of visual and verbal elements. Meanwhile, the positive student responses indicate the successful implementation of the somatic component and active learner engagement, reinforcing the effectiveness of a multimodal learning approach.

These findings are consistent with previous studies by Jum' et al. (2021) and Mukarromah et al. (2025), which reported significant improvements in student motivation and learning outcomes through the integration of the SAVI model and interactive digital media. The results of this study also support the findings of Eriawan and Putra (2025), who emphasized the effectiveness of Canva-based media in facilitating multimodal learning. Therefore, the high feasibility scores reported in this study not only reflect technical validity but also demonstrate the successful application of instructional design principles aligned with the Cognitive Theory of Multimedia Learning (Mayer) and the SAVI approach, which emphasizes the integration of sensory and cognitive processes in learning (Aldalalah, 2012).

From a practical perspective, these interactive instructional materials can be adopted as supporting media for the Introduction to Computers course, particularly to enhance active student participation in learning abstract and conceptual content. However, this study is subject to certain limitations, including the relatively small sample size and the reliance on self-reported data from a single institution, which may limit the generalizability of the findings. Future research is recommended to employ pre-post experimental designs, involve control groups, and assess long-term learning retention to evaluate instructional impact more objectively and comprehensively.

CONCLUSION

Based on the findings of this study, it can be concluded that the development of SAVI-based (Somatic, Auditory, Visual, Intellectual) interactive instructional materials using the ADDIE framework for the Introduction to Computers course resulted in a product that is highly feasible for instructional use. Expert validation results indicated scores of 4.6 for content quality, 4.4 for media design, and 4.3 for student responses, all of which fall within the Highly Feasible category. These results demonstrate that the developed instructional materials exhibit high quality in terms of content clarity, interactive design, and ease of use for students. The findings further confirm that integrating multimodal principles as articulated in the SAVI framework and the Cognitive Theory of Multimedia Learning (Mayer) can enhance student engagement and conceptual understanding through learning experiences that combine physical activity, auditory input, visual representation, and critical thinking. The application of this integrated approach proved effective in fostering an engaging and interactive learning environment, particularly for foundational content that requires visualization and active student participation. From a practical perspective, the developed interactive instructional materials have the potential to be adapted for other courses with similar conceptual characteristics, such as

Introduction to Information Technology or Fundamentals of Programming, to further strengthen student engagement and improve learning outcomes. For future research, it is recommended that experimental testing be conducted to quantitatively assess instructional effectiveness, as well as integration into a Learning Management System (LMS) to enable broader utilization and support sustainable digital learning practices in higher education.

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