

Development of Comic-Based Teaching Materials For Natural and Social Sciences (IPAS) Instruction In Grade III At Private Elementary School Kartika 1-2 Medan

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ABSTRACT

This study aimed to develop comic book-based teaching materials for the "Social Interaction" topic (Chapter 7) of the IPAS (Natural and Social Sciences) curriculum for third-grade students at Private Elementary School Kartika 1-2 Medan. The study employed the Research and Development (R&D) method using the ADDIE model, which comprises the stages of Analysis, Design, Development, Implementation, and Evaluation. The research subjects were 36 third-grade students from the school. Data were collected through questionnaires, tests, interviews, observations, and documentation. Quantitative data analysis was performed using percentage-based descriptive statistics. The results indicated that the comic-based teaching materials met the criteria of validity, practicality, and effectiveness. Validity was established through assessments by subject matter experts (88% and 84%), teaching material experts (85% and 100%), and media experts (84%). Practicality was demonstrated by student responses (91.25% in the small-group trial and 89.12% in the field trial) and teacher responses (90.41%). Product effectiveness was confirmed through field trials, yielding results of 98% in the initial group trial and 91% in the field trial; both results were categorized as "Highly Effective." Consequently, the comic-based teaching materials for the "Social Interaction" topic are deemed suitable for use in third-grade IPAS instruction, as they satisfy the aspects of validity, practicality, and effectiveness.

Keywords: comic-based teaching materials, social interaction, IPAS learning, ADDIE model, third-grade elementary students.

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INTRODUCTION

Based on the documentation of third-grade students' learning outcomes at SD Swasta Kartika 1-2 Medan obtained during the analysis stage, it was found that the available learning resources were still limited, with the IPAS textbook serving as the primary learning resource in the instructional process. Initial learning outcome data showed that, of the 36 students, 25 students (69.44%) obtained scores below the Learning Objective Achievement Criteria (KKTP) set at 70, while 11 students (30.55%) obtained scores above the KKTP. These data became one of the bases for identifying the need for teaching materials that were more appropriate to the students' characteristics and the learning content. In addition, based on observations and interviews conducted during the analysis stage, students showed greater interest in learning supported by illustrations and visual elements. This condition further emphasized the need to develop comic-based teaching materials for the Social Interaction topic in IPAS learning.

Previous research on the development of comic-based teaching materials was conducted by Diani Syahfitri (2023) through a study entitled *Development of Comic-Based Educational Resources to Foster Children's Creativity at SD IT Al-Anshar Tanjung Pura*. The study developed comic-based teaching materials for third-grade students, focusing on enhancing creativity, particularly in Topic 7 concerning the Development of Information and Communication Technology. The results showed that the developed teaching materials were feasible and effective for use in learning, as supported by media expert validation scores of 82.22% in the first stage and 85.30% in the second stage, as well as a material expert validation score of 80.45%. However, the previous study had a different content focus and development objective from the present study.

The research gap addressed in this study lies in the limited development of comic-based teaching materials specifically designed to present the Social Interaction topic in IPAS learning for third-grade students while considering the learning problems and needs identified at SD Swasta Kartika 1–2 Medan. This study does not merely develop comics as visual media but develops a comic book as teaching material containing learning content, illustrations, storylines, and learning activities related to students' daily experiences in the school environment. Thus, the novelty of this study lies in the development of comic-based teaching materials for the Social Interaction topic, designed according to the characteristics of third-grade students and the learning conditions at SD Swasta Kartika 1–2 Medan.

The development of the teaching materials in this study employed the ADDIE model, consisting of the Analysis, Design, Development, Implementation, and Evaluation stages. The selection of this model was based on the need to develop teaching materials systematically, beginning with needs analysis, product design, product development and validation, implementation, and evaluation. Through these stages, the comic-based teaching materials were developed by considering students' needs, the characteristics of the Social Interaction topic, and the learning conditions identified during the analysis stage. Therefore, this study focuses on developing comic-based teaching materials that are suitable for use in IPAS learning on the Social Interaction topic for third-grade students at SD Swasta Kartika 1–2 Medan.

LITERATURE REVIEW

In development research, a development model serves as a guideline for systematically designing and producing instructional products. Various models, including ADDIE, 4D, and Borg & Gall, possess distinct characteristics and developmental stages. Therefore, understanding the theoretical foundations of each model is essential to enable researchers to select the model that best aligns with the objectives and focus of the study. The ADDIE model is a systematic instructional design framework that integrates learners, learning content, and instructional media. According to Rizal et al. (2022:51), the ADDIE model is a systematic approach to instructional design that supports effective and efficient learning processes. Each phase is interactive and incorporates evaluation as the basis for refinement before proceeding to the subsequent stage. One of the principal strengths of the ADDIE model lies in its simple, systematic, and interconnected stages, making it relatively easy to understand and implement in instructional development. Nevertheless, the model also has a limitation in the analysis phase, which is often time-consuming because it requires a comprehensive examination of learners' needs and characteristics as the foundation for instructional design.

Based on the theoretical perspectives presented, the ADDIE model can be defined as a structured and sequential instructional framework designed to standardize the planning, development, implementation, and evaluation of instructional processes. Its primary purpose is to optimize pedagogical resources in order to ensure effective and efficient educational practices. This framework is widely applied in the development of various educational products, including teaching materials, instructional media, training programs, and curricula. Throughout the development process, each stage is continuously evaluated to ensure that the resulting products are aligned with learners' needs and characteristics.

Teaching materials are systematically organized collections of learning content, information, instructional tools, and educational texts developed to support the teaching and learning process in accordance with educational objectives. They assist students in understanding learning content, facilitate teachers in delivering instruction, and promote independent learning. Therefore, the development of teaching materials should be tailored to learners' characteristics and educational needs to maximize instructional effectiveness.

The theoretical foundation for the use of teaching materials is based on educational principles that support their planning, development, and implementation in elementary education. One of the fundamental theoretical perspectives is behaviorist learning theory, which conceptualizes learning as a change in observable behavior resulting from the interaction between stimulus and response. Accordingly, teaching materials should be systematically organized using simple language, concrete examples, structured practice activities, and reinforcement strategies to accommodate learners' developmental characteristics and facilitate the achievement of instructional objectives.

METHODS

This study employed the Research and Development (R&D) method using the ADDIE model, which consists of the stages of Analysis, Design, Development, Implementation, and Evaluation. The study was conducted at SD Swasta Kartika 1–2 Medan during the second semester of the 2025/2026 academic year. The research subjects were 36 third-grade students. An initial trial was conducted with a small group consisting of 2 students with different ability levels, while the field trial involved all 36 third-grade students.

Data were collected using expert validation sheets, student response questionnaires, teacher response questionnaires, learning outcome tests, interviews, observations, and documentation. Product validation involved five validators, consisting of two material experts, two teaching material experts, and one media expert. The validators were selected based on the relevance of their competencies to the aspects assessed in the developed product. Material experts assessed the suitability and feasibility of the content, teaching material experts assessed the aspects of the teaching materials, while the media expert assessed the visual and media aspects of the product.

The validation instruments and response questionnaires used a rating scale to obtain scores for each assessed aspect. Data from the validation and response questionnaires were analyzed using descriptive statistics by calculating the percentage of score achievement. The percentage was calculated by comparing the obtained score with the maximum score and multiplying the result by 100%. The resulting percentages were then interpreted based on predetermined criteria to determine the level of validity and practicality of the teaching materials.

The effectiveness of the teaching materials was analyzed based on students' learning outcomes after using the developed comic-based teaching materials. Effectiveness was determined based on students' learning achievement through a test administered after the product implementation. In addition, the research instruments used for data collection underwent testing to ensure their suitability before being used in the study. The results of the validity, practicality, and effectiveness analyses were used as the basis for determining the feasibility of the comic-based teaching materials for the Social Interaction topic among third-grade students.

RESEARCH FINDINGS AND DISCUSSION

This study was conducted at SD Swasta Kartika 1–2 Medan, located on Brigjen H.A. Manaf Lubis Street, Helvetia Tengah Village, Medan Helvetia District, Medan City. During the research period, the school was led by Mrs. Tiorlan Hutabalian as the principal, while the third-grade class was supervised by Mrs. Indah Kusuma Dewi, with the support of the entire teaching staff of SD Swasta Kartika 1–2 Medan. The research was carried out over four instructional sessions, held on May 7, 8, 9, and 11, 2026. Prior to the implementation of the study, the researcher conducted classroom observations to obtain an overview of the existing teaching and learning conditions. The participants consisted of 36 third-grade elementary school students. Participants were selected using purposive sampling, whereby the sample was chosen based on specific criteria that were consistent with the objectives of the study. The primary objective of this research was to analyze and describe the development of comic-based teaching materials for Natural and Social Sciences (IPAS) for third-grade students at SD Swasta Kartika 1–2 Medan.

Fourth-Grade Post-test Results

In this study, students were assessed at the end of the instructional process through a post-test. The purpose of this assessment was to determine students' learning achievement and evaluate the improvement in their academic performance following the implementation of the Discovery Learning model. The post-test results are presented in the table below.

Table 1. Third-Grade Post-test Scores

Respondents	Mark	Information
1	95	Very Good
2	100	Very Good
3	45	Needs Guidance
4	100	Very Good
5	100	Very Good
6	100	Very Good
7	100	Very Good
8	95	Very Good
9	100	Very Good
10	95	Very Good
11	100	Very Good
12	35	Needs Guidance
13	85	Good
14	95	Very Good
15	70	Enough
16	100	Very Good
17	40	Needs Guidance
18	95	Very Good
19	100	Very Good
20	100	Very Good
21	95	Very Good
22	100	Very Good
23	100	Very Good
24	100	Very Good
25	100	Very Good
26	95	Very Good
27	100	Very Good
28	90	Very Good
29	90	Very Good
30	95	Very Good
31	90	Very Good
32	95	Very Good
33	100	Very Good
34	100	Very Good
35	100	Very Good
36	95	Very Good
Amount		3295
Mean		91,53
N		36
The number that requires guidance		3
Sufficient quantity		1
Good amount		1
excellent amount		31
Xmax		100
Xmin		35

Based on the post-test results obtained at the end of the implementation of the Discovery Learning model integrated with comic-based teaching materials, the students achieved a mean score of 91.53. This result indicates that, overall, students' learning achievement fell within the good to very good performance categories. Of the 36 students who participated in the study, 3 students (8%) were classified as requiring support, 1 student

(3%) achieved a fair level, 1 student (3%) was categorized as good, and 31 students (86%) attained very good performance. The highest score recorded was 100, while the lowest score was 35. The distribution of post-test scores demonstrates a reduction in learning disparities among students compared with their performance prior to the implementation of the instructional model. These findings suggest that the integration of comic-based teaching materials into the Discovery Learning approach contributed to improving students' overall academic achievement by creating a more engaging and stimulating learning experience, while also promoting a more balanced distribution of learning outcomes. To provide a clearer overview of the third-grade students' post-test performance, the data are presented in the following frequency distribution table.

Table 2. Frequency Distribution of Post-test Scores

X	F	F _x	X ²	F _x ²
35	1	35	1.225	1.225
40	1	40	1.600	1.600
45	1	45	2.025	2.025
70	1	70	4.900	4.900
85	1	85	7.225	7.225
90	3	270	8.100	24.300
95	10	950	9.025	90.250
100	18	1800	10.000	180.000
	36	3295	44.100	311.525

This study produced comic-based teaching materials for the "Social Interactions" topic within the IPAS (Natural and Social Sciences) curriculum for third-grade elementary students, utilizing the ADDIE development model. Expert validation confirmed that the developed materials met validity criteria, while teacher and student feedback indicated that the materials were highly practical for classroom use. Field trials yielded an average student post-test score of 91.53, with the majority of students achieving learning outcomes classified as "excellent." These results suggest that the use of comic-based teaching materials positively influenced students' learning experiences and achievements regarding social interactions. Comics facilitate understanding by presenting content through visuals, dialogue, storylines, and situations that resonate with students' daily lives. However, as this study did not employ a pre-test/post-test design or a control group, the findings cannot establish a causal relationship or experimentally prove an improvement in learning outcomes. Therefore, future research is encouraged to utilize pre-test/post-test or experimental/quasi-experimental designs to evaluate the effectiveness of comic-based teaching materials more robustly.

Table 3. Percentage Distribution of Third-Grade Post-test Scores

Mark	Frequency	Percentage	Information
90-100	31	86%	Very Good
79-89	1	3%	Good
68-78	1	3%	Enough
0-67	3	8%	Guidance needed
Amount	36	100%	

The analysis of the post-test data revealed the following distribution of students' achievement levels. Three students (8%) obtained scores ranging from 0 to 67, placing them in the "Needs Support" category. One student (3%) achieved a score between 68 and 78, which was classified as "Fair." Another student (3%) obtained a score ranging from 79 to 89, placing them in the "Good" category. Meanwhile, the majority of students, 31 out of 36 (86%), achieved scores between and 100, categorizing their performance as "Very Good." These findings indicate that most students attained a high level of learning achievement following the implementation of the instructional intervention.

Table 4. Needs Analysis Data

Question	Answer	Frequency Learners	Percentage
Do you enjoy learning Natural and Social Sciences (IPAS)?	Yes	24	67%
	No	12	33%
Has the teacher ever used teaching materials in science learning?	Yes	30	83%
	No	6	17%
Do you find it easier to understand IPAS concepts using learning materials such as images, videos, or comics?	Yes	34	94%
	No	2	6%
Do you feel motivated and enthusiastic about learning IPAS when using comic-based media?	Yes	33	92%
	No	3	8%
Do you need visual teaching materials for the learning process?	Yes	26	72%
	No	10	28%

Based on the data presented in Table 4, which summarizes the needs analysis from the students' perspective, several important findings emerged. Twenty-four students (67%) expressed a positive interest in the Natural and Social Sciences (IPAS) subject, while 12 students (33%) did not. Regarding the use of teaching materials, 30 students (83%) reported that their teacher used instructional materials during IPAS lessons, whereas 6 students (17%) indicated otherwise. The majority of students, 34 (94%), stated that the use of visual learning media, such as pictures, videos, or comics, helped them understand the learning content more easily, while only 2 students (6%) considered such media to be less beneficial. Furthermore, 33 students (92%) reported feeling more motivated and actively engaged in IPAS learning when comics were incorporated into instruction, whereas 3 students (8%) did not perceive any significant difference in their learning motivation. Finally, 26 students (71%) indicated that image-based teaching materials were needed to support the learning process, while 10 students (29%) did not consider them necessary. Overall, these findings demonstrate a strong positive perception among students toward the use of visual instructional media, particularly comic-based teaching materials, in IPAS learning.

CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study and the development of comic-based teaching materials, the following conclusions can be drawn:

1. A product validation process followed the development of the comic-based teaching materials to determine their feasibility for classroom use. The quality of the materials was evaluated using both qualitative and quantitative data. Qualitative data were obtained from comments, suggestions, and recommendations provided by material experts, media experts, and the third-grade classroom teacher to improve the instructional product. Quantitative data were collected through validation questionnaires using a five-point Likert scale completed by the validators. The validation results indicated that the developed comic-based teaching materials were highly feasible for use in third-grade Natural and Social Sciences (IPAS) instruction. Consequently, the developed materials can be considered effective in creating a more engaging learning environment while enhancing students' understanding of the learning content. Media expert validation yielded scores of 84% and 90%, both categorized as highly valid. Content and material experts awarded scores of 88% and 84%, respectively, which also fell within the highly valid category. Furthermore, the learning module experts provided validation scores of 85% and 100%, indicating a high level of validity. These findings demonstrate that the comic-based teaching materials developed for Chapter 7, "Social Interaction at School," for third-grade students at SD Swasta

- Kartika 1–2 Medan possess a high degree of validity and are therefore appropriate for implementation in the teaching and learning process.
2. The comic-based teaching materials for third-grade IPAS were developed using the ADDIE instructional design model, which consists of the Analysis, Design, Development, Implementation, and Evaluation phases. The resulting product was a comic-based instructional resource that presented IPAS content through stories, illustrations, dialogues, and visual representations specifically designed to match the developmental characteristics of elementary school students. The product included several components, such as the cover page, user guide, learning objectives and outcomes, instructional content, case studies, practice exercises, and a final assessment. Product effectiveness was confirmed through field testing, achieving 98% in the preliminary group trial and 91% in the field trial, both of which were classified as Highly Effective.
 3. In addition, the comic-based teaching materials obtained a practicality score of 89.71% based on students' evaluations, placing them in the Highly Practical category. The classroom teacher's evaluation produced a practicality score of 90.41%, which was likewise categorized as Highly Practical. These findings indicate that the comic-based teaching materials developed for Chapter 7: Social Interaction at School in the third-grade IPAS curriculum at SD Swasta Kartika 1–2 Medan are highly practical, easy to use, and effective in supporting the teaching and learning process.

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