



# ETHNOSCIENCE-BASED COMIC STRIPS AS LEARNING MEDIA TO IMPROVE SOCIAL SKILLS OF ELEMENTARY SCHOOL STUDENTS: INTEGRATED SCIENCE AND SOCIAL STUDIES

Yuliana<sup>1</sup>, Rambang Muharramsyah<sup>2</sup>, Nadia Aldyza<sup>3</sup>

<sup>1,2,3</sup> Master of Elementary Education, Universitas Almuslim, Bireuen, Aceh, Indonesia

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## ABSTRACT

The rapid development of digital media and the decline of students' social interaction skills highlighted the need for innovative learning media, such as ethnoscience-based comic strips as learning media, to effectively enhance elementary school students' social skills. This study was conducted to investigate the effectiveness of ethnoscience-based comic strips as instructional media in enhancing the social skills of elementary school students. A quasi-experimental method with a non-equivalent control group design was applied. The experimental group was taught using ethnoscience-based comic strips, while the control group received instruction through conventional teaching methods. The participants consisted of 60 students selected through cluster sampling techniques. Data were gathered using a questionnaire, with validity tested using Aiken's V index and reliability measured through Cronbach's alpha coefficient. The data analysis employed a descriptive quantitative approach. The findings revealed a significant difference in students' social skills between the experimental and control groups ( $\text{Sig} = 0.00 < \alpha$ ). There was a notable improvement in social skills, as indicated by an increase in the average percentage from 75% (good category) to 81% (very good category) based on teachers' questionnaire assessments. Furthermore, the effectiveness test using the Gain Score indicated an improvement of 0.61, categorized as good, based on pretest and posttest results. Observations of student activities also showed a positive outcome, with a percentage of 80%, meeting the criteria for good performance. Theoretically, this study suggests that ethnoscience-based comic strips, designed with engaging visuals and integrated social skill components, serve as an effective learning medium.

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## Corresponding Author:

Yuliana

Master of Elementary Education, Universitas Almuslim, Bireuen, Aceh Indonesia

Email: [yuliana.juli0112@gmail.com](mailto:yuliana.juli0112@gmail.com)

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## 1. INTRODUCTION

The socialization is a fundamental mechanism through which children internalize the normative values and behavioral patterns sanctioned by their community, ensuring their effective integration into the social fabric socialization process is a process when children learn the value and behaviors accepted by society (Mareta et al., 2021). Therefore, teachers must play a role in building a conducive learning environment, as well as their contribution to society in instilling

moral values and social skills in students (Oktafryani et al., 2026). The surrounding environment also contributes to the formation of a child's personality. In the subsequent stage, children begin to understand the behaviors they imitate and gradually develop the ability to differentiate between acceptable behaviors that have positive effects and those that are inappropriate (AL-Momani, 2022). In line with this opinion, (Mainita et al., 2025) stated that schools must incorporate relevant technology into the curriculum so that students receive character education that teaches moral and ethical values so they can empower social skills properly.

The integration of ethnoscience-based comic strips as learning media in IPAS (Integrated Science and Social Studies) learning provides a contextual and meaningful learning experience for elementary school students. Ethnoscience emphasizes the incorporation of indigenous knowledge, local wisdom, and cultural practices into scientific concepts, enabling students to understand science as part of their daily lives rather than as abstract knowledge (Usman Ali et al., 2025) (Aikenhead & Michell, 2011). When presented through comic strips, ethnoscientific content becomes more accessible and engaging, as visual narratives help students connect scientific phenomena with local cultural contexts, such as traditional agriculture, environmental conservation, and community-based social interactions. Extant literature substantiates that utilizing comics as a pedagogical tool can significantly bolster student motivation and conceptual clarity, comprehension, and conceptual understanding in science learning, particularly at the elementary level (Zuhrotun Nafisah & Pratama, 2020).

In the context of IPAS learning, ethnoscience-based comic strips not only facilitate cognitive understanding of scientific and social concepts but also support the development of students' social skills. The narrative structure of comic strips allows students to observe social interactions, cooperation, empathy, and problem-solving behaviors embedded within culturally relevant scientific scenarios. This aligns with the goals of IPAS, which integrates natural and social sciences to foster holistic learning and character development. Research indicates that learning media grounded in ethnoscience can strengthen students' social awareness, communication skills, and collaborative attitudes (Madhu Kumari & Dr. Santanu Biswas, 2023). Therefore, the use of ethnoscience-based comic strips in IPAS learning serves as an innovative pedagogical approach that bridges scientific knowledge, cultural identity, and social skill development, making learning more meaningful and relevant for elementary school students.

Integrating local cultural values into elementary school learning allows students to learn about the diverse cultural richness of the region (Sakti et al., 2024). Therefore, teachers must also learn different learning styles tailored to their students' needs (Wilson, 2012). The science learning process prioritizes direct, hands-on experiences to foster core competencies, allowing students to systematically interpret the natural world (Imran & Amini, 2019). Instructional practices in science center on first-hand exploration, facilitating the development of core skills and a rigorous, evidence-based understanding of nature. In every educational setting, science instruction should be conducted in an interactive, inspiring, and enjoyable manner, while also being effective instructional media should be intellectually stimulating, compelling students to shift from passive reception to active engagement. Furthermore, it must provide substantive prospects for learners to exercise agency and creativity, ensuring that the learning trajectory is commensurate with their individual talents and psychological maturity. (McFarlane, 2013). Student involvement in science learning can be achieved through the use of innovative and diverse educational models or designs,

the use of interesting media, and the promotion of sufficient educational opportunities. All of this is done well.

Extant literature has extensively investigated the application of comics as instructional tools within primary school settings; however, most of them focus primarily on improving students' cognitive outcomes rather than their social skills. In addition, research integrating ethnoscience into comic-integrated learning resources, particularly in the context of elementary school learning, is still limited and has not been widely implemented. Therefore, studies that develop and implement ethnoscience-based comic strips as learning media to improve elementary school students' social skills within integrated science and social studies learning remain insufficient and require further investigation. Based on interviews at SD Negeri 4 Bandar Baru, students come from diverse social backgrounds. In particular, some fourth-grade students live with their grandmothers or relatives. Lack of attention often leads to disagreements in their learning environment, such as choosing friends, and problems also arise due to the diverse professions of their parents. This is further compounded by common problems such as students not integrating lessons with their daily lives and not attaching meaning to their learning process. The main problem with education is that most students cannot connect what they learn to everyday life. This is due to the fact that the learning they receive focuses more on memorization rather than practice (Alkhateeb & Milhem, 2020).

So far, comics have been created digitally to improve learning effectiveness without empowering social skills values (Lusiana & Nuryanto, 2025). Based on observations with students at SD Negeri 4 Bandar Baru, approximately 73.3% of students show greater enthusiasm for learning when using colorful comics. As a result, comic media has evolved into more engaging, colored formats. This aligns with the findings of (Ryanto et al., 2025), which indicate that learning media can enhance the teaching and learning process, ultimately leading to improved student outcomes. Learning media can also help address existing challenges due to its ability to provide consistent stimulation and foster similar perceptions among learners (Matje, 2022). Comic media in learning can be used to stimulate student learning and ultimately improve students' problem-solving abilities (Ulviah et al., 2021).

One effort to improve social skills is by using comic strips based on ethnoscience. According to Suyitno (2012), in building and instilling national culture in students, educators and education personnel become agents of change. Teachers are not only competent, but also serve as role models (in attitudes, thoughts, and behavior), creative, and well-adaptive (complete professionals). Ethnoscience, or local wisdom, originates from the collective ideas of a community that are regarded as valuable and eventually serve as guidelines for daily life. This local wisdom is rooted in a shared sense of harmony and well-being within the community. These local cultural values embody the rules currently in force in society for collective activities. Ethnoscience that has Pancasila values must always be implemented in everyday life to be able to filter out the influence of foreign cultures entering Indonesia (Leonia, 2014; Ulviah et al., 2021).

Relevant research conducted by (Rahayu et al., 2026) Local wisdom loaded into comic media can increase social values in junior high school students in Yogyakarta city, In line with this research, Riwanto & Wulandari (2018) (Irdalisa et al., 2023) also stated that The use of digital comic media can enhance the effectiveness of learning, particularly on the theme *Always Save Energy*. Students tend to be more enthusiastic, as they not only read the material but also engage with visual representations such as cartoon characters. Aligned with these findings, Purnama et al.

(2024) established that digital graphic narratives can substantially bolster students' enthusiasm and commitment to mastering life skills, encourage both physical and emotional engagement, and facilitate the learning process. In innovative learning environments, teachers are encouraged to utilize instructional media, as it serves as a key factor in supporting the success of classroom learning (Irdalisa et al., 2020). There is a significant difference in learning activity between students who use comics and those who do not. Students who use comics demonstrate greater engagement during the learning process than those who do not (Alie et al., 2021). Based on the description above, it is necessary to analyze the application of the model to ethnoscience-based comic strips as learning media to improve the social skills of fourth-grade elementary school students. Therefore, the research question is how effectiveness of ethnoscience-based comic strips as learning media in improving elementary school students' social skills.

## **2. METHOD**

Research Design use adopting a quasi-experimental framework, this study utilized a non-equivalent pretest-posttest control group design to assess the relative gains in social skills across two distinct cohorts. The experimental group was instructed using ethnoscience-based comic strips, while the control group received teaching through a conventional approach. The learning activities in both groups were organized differently. In the conventional class, students engaged in discussions, followed by teacher-led explanations of the material. The lecturer plays a more dominant role in this setup, delivering content through traditional lectures. In contrast, ethnoscience-based comic strips follows these steps: analyzing learning needs, selecting relevant ethnoscience elements, and comic strips aligned with the learning objectives. The implementation stage involved introducing the learning context, guiding students to read the comic strips, and facilitating discussions and learning activities that emphasized social interactions and cultural values presented in the stories. Students then engaged in reflective and collaborative activities to reinforce the learning outcomes.

The topic of changes in the states and properties of matter is highly suitable for integration with ethnoscience-based comic strips in elementary school science learning, as the scientific concepts involved can be explained through real-life phenomena that are familiar to students. One relevant example of ethnoscience is the process of cooking traditional local foods, such as steaming, boiling, or frying, which involves changes in the state of matter due to heat energy. Through comic strips, these processes can be presented in a sequential and visually engaging manner, making abstract scientific concepts such as melting, evaporation, and solidification easier for students to understand. In addition to strengthening conceptual understanding, the narrative structure of comic strips allows the inclusion of social values inherent in traditional cooking activities, including cooperation in task distribution, carefulness in following procedural steps, and effective communication among group members. Therefore, the use of ethnoscience-based comic strips in teaching changes in the states and properties of matter.

The research sample comprised 60 fourth-grade students, equally distributed into an experimental group (n=30) and a control group (n=30). The study was conducted at this specific site due to its robust digital infrastructure and the prevalence of technology-based instructional media, which provided an ideal environment for the intervention. A cluster sampling technique was used to select the participants and received approval from participants. Some reasons why cluster sampling is chosen cluster sampling allows researchers to reduce costs and time required.

Researchers only need to take samples from a portion of the cluster, not the entire population. Given the large sample size, groups were predetermined for sampling.

Instruments and data collection involved administering questionnaire instrument to assess the students' the social skills. Social Skills Scale Grid is presented in Table 1 below:

Table 1. Social Skills Scale Grid

Variable	Aspect	Indicator
Social Skills	Peer Relation Skill	1. The attitude of addressing others by their names
		2. The ability to pay attention to the person who is speaking
		3. The habit of maintaining eye contact during conversations
		4. The openness to accept others' comments and ideas
		5. The ability to participate appropriately in casual conversations
		6. The attitude of responding appropriately to rumors
	Self-management skills	1. The ability to employ measured vocal delivery
		2. A civilized manner of speech, reflecting effective interpersonal management
	Academic skills	1. Behaviour that pays attention to others' understanding
		2. Attitude of asking appropriate questions
		3. Attitude of maintaining appropriate distance
		4. Attitude of asking for direction or assistance

Based on Table 1, to guarantee the instrument's accuracy, two experts in education performed a validation process based on the Aiken index (V). This analysis confirmed that the items were suitable for measuring the intended constructs. Reliability testing via Cronbach's alpha resulted in a score of 0.83, categorizing the Social Skills instrument as highly reliable (Taber, 2018). These evaluative outcomes are presented in Table 2.

Table 2. The results of the Aiken Index Coefficient of Instrument Validity

Instruments	V	Validity
Social Skills	0.82	Valid

Based on Table 2, data analysis was conducted as follows: To assess the efficacy of the ethnoscience-based comic strips, an independent samples t-test was performed, following successful normality (Kolmogorov–Smirnov) and homogeneity (Levene's) screenings. Significant differences were determined based on a  $p < 0.05$  criterion. This analysis served to compare the mean social skill improvements between the two groups, indicating whether the intervention yielded a superior pedagogical outcome.

### 3. RESULTS AND DISCUSSION

The effectiveness of implementing ethnoscience-based comic strip learning media is assessed by its impact on improving students' social skills. The model is considered effective if it results in an enhancement of these skills. The results of the initial test include normality and homogeneity

assessments. Normality is tested using the Kolmogorov-Smirnov method, with the experimental class showing a significance value of 0.231 and the control class showing 0.122. Since both values are greater than 0.05, the data from the questionnaires are considered to be normally distributed. In the homogeneity test for students' social skills, the significance value is 0.230. Because this value exceeds 0.05, it suggests that the data come from a population with homogeneous variance. Additionally, the effectiveness of the model is evaluated through the results of the independent sample t-test.

Conduct The results substantiate that ethnoscience-integrated comic strips are significantly more effective than conventional methods in augmenting students' social skills ( $p < 0.05$ ). The experimental group demonstrated a substantial gain, reaching a post-test average of 82.30 from an initial 13.64. In contrast, the control group, while showing improvement, only reached a mean of 61.78 from a baseline of 11.54. These findings, detailed in Table 3, underscore the superiority of visual-narrative media in fostering interpersonal skills.

Table 3. Description of Social skills

Variable	Stat.	Ethnoscience-based comic strip learning media				Conventional Teaching			
		n	Pre-test	Post-test	N<G>	n	Pre-test	Post-test	N<G>
Social skills	$\bar{x}$		13.64	82.38	.81		11.54	61.78	.28
	%	30	25	100		30	25	75	
	s		1.46	1.97			1.45	1.82	

Table 4. The result of independent sample t- test

Group		t	Asymp. Sig. (2-Tailed)
Pretest	Experiment Control	.621	.012
Posttest	Experiment Control	13.203	.000

The Table 4 indicates that the p-value is less than 0.05, leading to the rejection of  $H_0$ . Therefore, it can be concluded that a significant difference exists in social skills between the experimental and control groups. This suggests a clear variation in the average social skill scores between the two instructional approaches. The findings reinforce that ethnoscience-based graphic narratives are a more potent tool for augmenting students' social skills than conventional teaching methods. This conclusion is substantiated by the significant gains observed between the initial and final assessments. Furthermore, the instructional process achieved an 80% student activity rating, reflecting a highly stimulating and interactive learning environment. which falls within the 61%–80% range and meets the criteria for a “Good” level of achievement.

Based on the analysis conducted to assess students' skill levels, three main aspects were evaluated: specifically in terms of peer-to-peer dynamics, self-discipline, and scholastic achievement. The data suggests that students achieve enhanced learning absorption through comic-integrated instruction, which proved significantly more effective than conventional approaches. These results echo the research by Rasmet et al. (2025), highlighting the transformative impact of visual-narrative media on student success and motivation among seventh-grade students at SMP Negeri 25 Takengon. Effectiveness and efficiency in learning refer to the extent to which learning objectives are achieved after the instructional process. Learning is considered effective when the objectives are successfully attained, and it is deemed efficient when these objectives are achieved using appropriate media within a shorter time frame (Adelowo et al., 2024). Effective and efficient learning media play an important role in supporting improved learning outcomes. In this study, the primary objective was to enhance students' skills, and based on the findings, the developed comic media can be classified as effective.

The findings of this study can be compared with those of previous research. This study differs from the work of (Adelowo et al., 2024), titled “*The Effect of Using Educational Comic Media on Reading Interest in Indonesian Language Content in Fourth Grade Elementary School Students.*” In that study, the comic-based media was designed to increase students’ reading interest, whereas the present study focuses on improving students’ social skills. The earlier research evaluated the effectiveness of the media in relation to students’ reading interest, providing a reference point for comparison. In contrast, this study not only examines learning outcomes but also incorporates specific instruments to assess the development of students’ social skills, offering a broader evaluation of the media’s impact.

The findings of this study indicate that comic strips integrating ethnoscience were effective in enhancing elementary school students’ social skills. This effectiveness can be attributed to the visual–narrative format of comic strips, which allows students to easily understand social situations, emotions, and interpersonal interactions presented in meaningful contexts. Visual storytelling has been shown to support children’s social and emotional learning by making abstract social concepts more concrete and relatable (Mayer & Fiorella, 2021). Through culturally grounded stories, students were able to recognize appropriate social behaviors such as cooperation, empathy, and respectful communication. Integrating ethnoscience into comic strip learning media also played a significant role in increasing students’ engagement and sense of relevance during learning. Cultural familiarity helps learners connect new knowledge with their lived experiences, which enhances comprehension and internalization of values (Geneva Gay, 2018). In this study, local cultural elements such as traditional settings, social norms, and community-based interactions enabled students to see social skills not as abstract rules, but as practices embedded in their daily lives. This supports previous research emphasizing culturally responsive learning media as a powerful tool for character and social development in elementary education (Yaqin, 2024).

Furthermore, the use of comic strips facilitated social interaction during the learning process itself. Students engaged in group discussions, role-playing, and reflective conversations based on the comic narratives, which directly supported the development of communication and collaboration skills. Active learning strategies embedded in narrative-based media have been shown to improve students’ social competence by encouraging dialogue, perspective-taking, and cooperative problem-solving (Hwang et al., 2015). These interactive activities allowed students to practice social skills in a structured yet enjoyable learning environment. The improvement in students’ social skills is also aligned with social learning theory, which emphasizes learning through observation and modeling. Characters in comic strips functioned as social models, demonstrating positive behaviors and consequences within culturally familiar situations. According to Bandura’s social cognitive framework, learners are more likely to adopt behaviors when models are perceived as relevant and relatable (Schunk & DiBenedetto, 2020). The culturally contextualized comic characters in this study strengthened students’ identification with the modeled behaviors, thereby enhancing social skill acquisition.

In addition, comic strips integrating ethnoscience supported inclusive learning by accommodating diverse learning styles. Visual learners, in particular, benefited from the combination of images and short dialogues, while students with lower reading proficiency were still able to grasp social messages through illustrations. Previous studies confirm that multimodal learning media can reduce cognitive load and increase accessibility for elementary school students

(Paivio, 2014). This inclusivity likely contributed to the overall effectiveness of the media in improving social skills across students with varying abilities.

Despite these positive findings, this study has certain limitations. The implementation was limited to a specific grade level and cultural context, which may affect the generalizability of the results. Future studies are recommended to explore the use of ethnoscience-based comic strips across different regions, grade levels, and social skill dimensions. Additionally, longitudinal research could examine the long-term impact of culturally integrated comic media on students' social behavior. Nevertheless, the results of this study provide strong empirical support for the use of ethnoscience-based comic strips as an effective learning medium for enhancing elementary school students' social skills.

#### **4. CONCLUSION**

This study concludes that comic strips integrating ethnoscience are effective learning media for enhancing elementary school students' social skills. The integration of culturally relevant narratives, visual elements, and social contexts enabled students to better understand, internalize, and practice positive social behaviors such as cooperation, empathy, communication, and respect. The findings demonstrate that ethnoscience-based comic strips not only support students' social skill development but also increase engagement and meaningful learning by connecting instructional content with students' real-life experiences. Therefore, the use of culturally integrated comic strip media represents a valuable pedagogical approach for social skills development in elementary education. Based on the findings, it is recommended that elementary school teachers incorporate ethnoscience-based comic strips as alternative or supplementary learning media to support social skills instruction. Schools and curriculum developers should encourage the integration of local cultural values into instructional materials to foster culturally responsive and character-oriented learning environments. In addition, teacher training programs should provide professional development on designing and implementing comic-based and culturally responsive learning media to maximize their instructional impact. Future research is suggested to examine the effectiveness of ethnoscience-based comic strips across different grade levels, multiple regions and distinct cultural backgrounds to strengthen the generalizability of the current research. Moreover, there is a pressing need for longitudinal studies to evaluate the longevity of the impact that comic strip-based media has on students' behavioral changes.

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