



ANALYSIS OF STUDENTS CHARACTER THROUGH SCIENCE-BASED EXTRACURRICULAR ACTIVITIES: A CASE STUDY AT SUNGAI KURUK III STATE ELEMENTARY SCHOOL, SERUWAY DISTRICT, ACEH TAMIANG REGENCY

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ABSTRACT

This study aimed to analyze student character through science-based science-based extracurricular activities at Sungai Kuruk III State Elementary School, Seruway District, Aceh Tamiang Regency. This research used a qualitative approach with a case study method. The research subjects included students participating in extracurricular activities, the supervising teacher, and the principal. Data collection techniques included observation, in-depth interviews, and documentation. The data were analyzed using interactive analysis techniques, including data reduction, data presentation, and conclusion drawing. The results indicated that science-based extracurricular activities played a significant role in developing students' student characters, such as the ability to work together, communicate, respect others' opinions, discipline, and responsibility. The interactions established in group activities encouraged students to be more confident and able to adapt to their student character environment. Furthermore, the supervising teacher played a significant role in guiding and shaping students' positive student character behavior. The conclusion of this study was that science-based extracurricular activities were an effective means of improving students' student characters. Therefore, schools were expected to continue developing targeted and sustainable extracurricular programs to support students' student character development. Future research is recommended to explore the development of students' scientific through science-based extracurricular activities using mixed-methods or quantitative approaches in order to obtain more comprehensive and generalizable findings. Further studies may involve larger samples from different schools, regions, and educational levels to compare patterns of student character development in diverse contexts.

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1. INTRODUCTION

Elementary school education plays a fundamental role in shaping students' character. Education aims not only to improve academic abilities but also to develop character that support positive interactions in society. Character include the ability to communicate effectively, cooperate, appreciate differences, resolve conflicts, and empathize with others. These essential for

developing a generation capable of actively contributing to society (Istianah et al., 2023). Science-based extracurricular activities in elementary schools play a strategic role in developing students' characters. Through activities outside of formal learning, students have the opportunity to interact with peers in a more relaxed and flexible atmosphere (Hurriah et al., 2023). Activities such as scouting, sports, arts, or literacy clubs enable students to learn to work together, build self-confidence, appreciate differences, and resolve conflicts in a positive manner (Ningrum et al., 2024; Sugiyah, 2023). These are crucial for equipping students to face the challenges of future student character life. Character has become essential competencies that students must develop alongside academic achievements such as communication, cooperation, empathy, and responsibility are fundamental for students' personal and professional lives (OECD, 2018). Schools are expected to prepare learners not only intellectually but also student character and emotionally. Science-based extracurricular activities provide meaningful contexts where students can interact, collaborate, and practice student character values in real-life situations (Eccles & Barber, 2016). Therefore, examining how these activities contribute to student character development is crucial for improving educational quality.

Despite the importance of student character, many elementary school students still experience difficulties in interacting effectively with peers and teachers. Digital technology, limited face-to-face interaction, and academic pressure have reduced opportunities for student character learning (Twenge, 2019). In rural and semi-urban areas, including Aceh Tamiang Regency, limited facilities and program variations further constrain students' student character experiences. As a result, schools must optimize available extracurricular programs to support students' holistic development. This condition highlights the urgency of investigating how science-based extracurricular activities function as student character learning environments. In the context of extracurricular activities, teachers or activity instructors play a crucial role as facilitators, guiding students toward healthy and productive interactions (Awaludin, 2022). Through simulations, group games, or joint projects, students are not only trained to achieve specific goals but also to understand the values of togetherness and responsibility (Mariyaningsih & Hidayati, 2018). This process helps shape students' character while strengthening their communication and team works. Furthermore, the success of developing character through science-based extracurricular activities is also influenced by support from schools and parents (Senda & Ahmad, 2025). Schools need to ensure that science-based extracurricular activities are designed inclusively and tailored to students' needs, while parents can provide encouragement and recognition for their children's participation in these activities (Sasmita, 2024). With synergy between schools, activity instructors, and families, students' scientific can develop optimally.

This research confirms and strengthens previous findings that extracurricular activities play a significant role in fostering students' character development. Earlier studies have consistently reported that extracurricular programs contribute to the cultivation of responsibility, discipline, cooperation, leadership, environmental awareness, and social values because they provide authentic learning experiences beyond formal classroom instruction. The findings of this study support these conclusions by demonstrating that science-based extracurricular activities encourage students to practice positive character values through observation, experimentation, teamwork, and problem-solving in real-life contexts. Furthermore, this research supports the perspective that science education should not only emphasize cognitive achievement but also promote character formation. Previous studies have shown that inquiry-based and experiential science learning

develops scientific attitudes such as curiosity, honesty, responsibility, perseverance, and respect for evidence. The present study confirms that these values can also be effectively nurtured through extracurricular science activities, where students actively engage in hands-on investigations and collaborative projects.

Previous studies have mostly focused on the quantitative measurement of character or academic outcomes of extracurricular participation (Fredricks & Eccles, 2015; Mahoney et al., 2020). However, limited research has explored students' student character development through in-depth qualitative case studies, particularly in elementary schools in rural Indonesian contexts. Most existing studies emphasize secondary education or urban settings, leaving primary education underrepresented. Therefore, this study addresses the gap by providing a contextual and comprehensive qualitative analysis of character development at Sungai Kuruk III State Elementary School. Several studies have demonstrated positive relationships between extracurricular participation and student character development. Darling-Hammond et al. (2020) found that experiential learning environments enhance students' interpersonal. Similarly, Widodo and Surya (2019) reported that scouting activities improved students' teamwork and leadership abilities. A study by Lestari et al. (2021) showed that arts and sports programs foster empathy and self-confidence. Meanwhile, Nugroho and Pratiwi (2022) emphasized the role of teachers in shaping students' student character attitudes during extracurricular sessions. These findings support the assumption that science-based extracurricular activities are effective platforms for student character learning.

In addition to improving student characters, science-based extracurricular activities also provide students with the opportunity to develop their creativity and potential (Amaliyah & Rahmat, 2021). Through activities involving interactions with diverse individuals, students learn to understand their respective roles within a group and adapt to various situations. For example, in arts activities like drama or choir, students are trained to collaborate, listen to others' opinions, and appreciate the contributions of each group member. This process indirectly strengthens empathy and solidarity among students. Furthermore, science-based extracurricular activities can be a platform for learning leadership values, which are important in student character life (Agustina et al., 2023). In their roles as group leaders or activity coordinators, students are taught how to make decisions, manage conflict, and motivate team members to achieve common goals (Ode et al., 2024). These experiences not only help students recognize their potential but also hone theirs in managing interpersonal relationships effectively (Jayadih, 2024). However, the effectiveness of science-based extracurricular activities in developing students' scientific depends heavily on their implementation (Barokah et al., 2024). The selection of activity types, coaching methods, and time management must be tailored to students' needs and interests (Ariani, 2021). Furthermore, regular evaluation of the impact of science-based extracurricular activities is necessary to ensure that the goals of developing character are optimally achieved (Devi et al., 2023).

Well-designed science-based extracurricular activities also have the potential to reduce student character disparities among students (Damayanti & Niswatin, 2023). In an inclusive environment, students from diverse backgrounds are encouraged to work together regardless of differences in student character status, culture, or academic ability. This creates an enriching learning experience and fosters a sense of community, which is an important asset for them in student character life (Shofiyyah, et. al., 2023). However, various studies indicate that the character of elementary school students in Indonesia still require greater attention (Sumianto, et.

al., 2024; Amin, 2022). In some cases, students demonstrate difficulties in collaborating, lack empathy, and have poor ability to resolve conflicts constructively (Wibawa, et. al., 2022). This is a challenge that needs to be addressed immediately, given that character a crucial foundation for success in various aspects of life, including education, employment, and community life. Therefore, the research question is how to analyze students' scientific. Through science-based extracurricular activities at Sungai Kuruk III State Elementary School, Seruway District, Aceh Tamiang Regency

2. METHOD

Research designs this study seeks to analyze student character through science-based extracurricular activities at Sungai Kuruk III State Elementary School, Seruway District, Aceh Tamiang Regency. This study employed a qualitative research approach with a descriptive case study design. The qualitative method was chosen to explore in depth the implementation of the through science-based extracurricular activities. This approach allows the researcher to understand participants' experiences, perceptions, and interactions during the learning process. The research was conducted at Sungai Kuruk III State Elementary School, Seruway District, Aceh Tamiang Regency. The schools are located in adjacent areas, so the characteristics of the school community are similar. However, both schools have teachers with different personalities and diverse experiences, thus obtaining rich and diverse data to produce meaningful research results.

The research procedure was conducted systematically through several stages to obtain comprehensive data regarding the implementation of science-based extracurricular activities and their contribution to students' character development. Planning Stage: The first stage involved identifying the research problem, reviewing relevant literature on character education and science-based extracurricular activities, and obtaining research permission from the school. The researcher also prepared the research instruments, including observation sheets, interview guides, and document analysis checklists. The observation indicators focused on students' character values, such as discipline, responsibility, cooperation, curiosity, honesty, environmental awareness, and communication skills during extracurricular activities. Implementation of Science-Based Extracurricular Activities, the science-based extracurricular program was implemented according to the school's activity schedule. The activities emphasized scientific inquiry and experiential learning, enabling students to actively participate in scientific exploration while practicing positive character value

Participants: The research participants consisted of teacher and students selected through purposive sampling. Instrument and Data collection: The main research instrument was the researcher, who planned, conducted, and interpreted the study. Supporting instruments included observation sheets, interview guidelines, field notes, and document analysis checklists. Interview questions for teachers include: 1. What do you think about the level of students' scientific sin science-based extracurricular activities at this school? 2. What support do you provide to students to improve their character through extracurricular activities? 3. How do students work together in groups during activities? 4. Do students show empathy toward friends experiencing difficulties? 5. How disciplined are students regarding the rules in extracurricular activities?

Table 1. Observation Sheet

No	Indicator	Observed Aspect
1	Cooperation	Students are able to work together with their peers in completing extracurricular activity tasks.
2	Communication	Students are able to express ideas/opinions and listen to their peers' viewpoints.
3	Empathy	Students show concern for peers who experience difficulties.
4	Rule Compliance	Students comply with rules and follow the instructions of the activity supervisor.
5	Responsibility	Students carry out assigned tasks properly and complete them responsibly.

Qualitative data validity tests include credibility, transferability, dependability, and confirmability tests. Qualitative data validity tests include credibility, transferability, dependability, and confirmability tests. Data analysis was carried out using qualitative descriptive methods, namely data reduction, data presentation, and conclusions.

3. RESULTS AND DISCUSSION

Based on observations and interviews with the principal and supervising teachers, Sungai Kuruk III Public Elementary School offers four main extracurricular programs designed to develop students' non-academics, particularly student character. These activities are:

Scouting is a mandatory extracurricular program for students in grades 3 through 6. Activities are held weekly on specific days and last for 2-3 hours. According to an interview with the Scoutmaster, *"Scouts is designed to build discipline, responsibility, and teamwork. We conduct various activities such as basic scouting training, group games, and problem-solving simulations."* These activities involve students forming patrol groups, assigning specific tasks, and learning leadership values through a ranking system.

The sports program includes various sports such as soccer, badminton, and gymnastics. These activities are open to all students in grades I through VI, depending on their interests and abilities. Observations indicate that sports practices take place two to three times per week, facilitated by physical education teachers and other volunteer teachers. During an observation session of an inter-grade soccer match, researchers noted: *"Students demonstrated high enthusiasm in communicating with teammates, providing verbal encouragement, and managing emotions when faced with defeat. Some students who were initially hesitant showed increased confidence in participating."*

Dance is an extracurricular activity for fourth-sixth grade students, primarily girls, although it is open to all. Activities are held once a week and last for 1-2 hours. The art instructor explained, *"Through dance, students learn to collaborate in creating choreography, correct each other's movements, and support their peers when they feel awkward. Performing together is an important moment to strengthen group solidarity."* Religious activities include Quranic study, religious lectures, and adhan competitions. These activities involve all students and are implemented both within structured science-based extracurricular activities and integrated into

routine school activities. According to interviews, "Religious activities teach religious values while fostering respect, discipline in congregation, and concern for others through Islamic values."

Observations revealed significant variation in student communications. During scouting activities, researchers observed that students in leadership positions (squad leaders) demonstrated the ability to deliver clear instructions and listen to input from team members. A fifth-grade squad leader delivered the command in a firm but friendly tone: *"Guys, let's form two lines. If you don't understand, please ask me."*

However, students from quieter backgrounds or those with low self-esteem exhibited a different pattern. In a group interview with six students participating in sports activities, two of them admitted to difficulties: *"I'm shy about speaking in front of a large group of friends. I prefer to stay quiet."* However, the sports instructor reported that over time, these students showed improvement: *"With regular practice and a supportive environment, students who were initially passive began to dare to offer suggestions to their friends during play."*

In dance activities, nonverbal communication was more dominant. Observations showed students giving each other cues, correcting movements through gestures, and using facial expressions that conveyed appreciation for their peers' achievements. A fifth-grade student shared his experience: *"In dance, we don't need to talk much, but we understand each other. When a friend forgets a move, we immediately help without being asked."*

Observations of scouting activities revealed that students were capable of working together on structured tasks. When given the challenge of building a makeshift stretcher from available materials, a team of six students spontaneously divided roles: one as coordinator, two as material gatherers, two as tool users, and one as result checker. Observation notes: *"The division of roles occurred organically without any intervention from the instructor. Each member focused on their task but still communicated with each other to ensure the quality of the final product."*

In the context of sports, particularly soccer and badminton, teamwork is a functional necessity. Match observations showed students passing the ball to each other, giving up better positions to more players, and supporting teammates who made mistakes. However, there were also incidents where some students attempted to dominate the game, which the instructor addressed through discussions about the importance of collaboration. One sixth-grade student reflected: *"At first, I always wanted to be the goal scorer. But the teacher explained that winning is the result of teamwork, not individual achievement. Now I prefer playing as part of a team."*

In dance, cooperation reaches a very high level due to the interdependence of movements. Each student relies on their partner to form formations and create visual harmony. The art teacher explains: *"In dance, one small mistake by one student can ruin the entire performance. Therefore, students learn to focus not only on themselves but also on collective perfection. They correct each other constructively and patiently."*

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Observations of rule compliance in scouting activities revealed a consistent pattern. Students followed the marching rules, wore their full uniforms, and carried out the instructions of their scoutmasters. However, the level of awareness driving compliance varied. Some students complied with the rules out of fear of punishment, while others demonstrated an understanding that the rules were intended for the safety and efficiency of the group. An observation noted: *"When the teacher was not directly supervising, most students continued to follow established protocols, indicating internalization of the value of discipline."*

In sports activities, discipline manifested itself in respect for the rules of the game and the referee's decisions. Although some questioned or disagreed with decisions, students generally accepted them and continued playing. A fifth-grade student shared this reflection: *"I used to get angry immediately if the referee didn't agree with a decision. Now I understand that it's part of the game, and I have to be able to control my emotions."*

In dance, discipline manifested itself in punctuality, focus during practice, and a willingness to repeat movements repeatedly to achieve perfection. The art teacher stated, *"Art requires strict discipline. Students must arrive on time, concentrate fully, and be willing to revise their work. What's remarkable is that students do this not out of fear, but because they understand that the quality of the performance depends on collective dedication."* In religious activities, student character discipline manifests itself in adherence to hygiene rules before prayer, respect for religious teachers, and active participation in group activities. The principal observed, *"Discipline in religious activities has a deeper spiritual dimension. Students not only obey the rules, but they internalize the values underlying those rules."*

Observations of leadership are most evident in scouting activities, where the squad's ranking and leadership system are explicitly designed. Squad leaders are selected based on ability, responsibility, and group trust. Observations show that squad leaders demonstrate initiative in making group decisions, resolving internal conflicts, and ensuring squad members achieve activity targets. The observation notes: *"A sixth-grade squad leader, when his team members felt insecure in an activity, proactively provided intensive training and personal motivation. This demonstrates an awareness of individual needs and a commitment to collective growth."*

In sports activities, leadership emerged in the form of students acting as team captains and assisting teachers in managing activities. A sixth-grade basketball team captain demonstrated initiative by designing game formations and providing team motivation during games. Although his decisions were not always perfect, his teacher appreciated his efforts: *"Leadership is a learning*

process. The important thing is that students begin to take responsibility and try to lead their peers in a positive way."

In dance, leadership was evident in the form of students with better dance helping teach other students moves, or students taking the initiative to suggest choreography modifications that could enhance the aesthetics of the performance. The art teacher provides a platform for this leadership: *"I intentionally provide opportunities for students who show potential to lead and provide direction. This strengthens their confidence and shows other students that leadership can be distributed, not necessarily centralized in one person."*

Cooperation is a fundamental component of student character, especially in science-based extracurricular activities that emphasize teamwork and shared responsibility. Through cooperative learning and group-based tasks, students develop mutual trust, problem-solving abilities, and collective accountability. Johnson and Johnson (2017) argue that cooperative environments promote positive interdependence and individual responsibility, which contribute to academic and student character development. Similarly, Slavin (2018) states that structured cooperation encourages students to support each other's learning processes. In extracurricular contexts, cooperation enables students to complete tasks effectively while fostering a sense of belonging and solidarity among group members.

Communications play a crucial role in facilitating meaningful interactions among students during extracurricular activities. Effective communication allows students to express ideas clearly, negotiate differences, and listen actively to their peers. According to Hattie (2023), communication competence significantly influences collaborative learning outcomes and student character engagement. Furthermore, Vygotsky (1978) emphasizes that student character interaction through language is essential for cognitive and student character development. In extracurricular settings, students who demonstrate strong communication skills tend to participate more actively and contribute positively to group dynamics.

Empathy is another important indicator of character that reflects students' emotional awareness and student character sensitivity. Empathetic students are more likely to provide support to peers facing academic or personal challenges. Goleman (2011) highlights that emotional intelligence, including empathy, is a key factor in building healthy interpersonal relationships. In addition, Eisenberg et al. (2015) explain that empathy promotes positive student character behavior and reduces interpersonal conflicts. Within extracurricular activities, empathy strengthens peer relationships and creates a supportive learning environment that encourages cooperation and mutual respect.

Rule compliance demonstrates students' ability to respect institutional norms and authority within organized activities. Adherence to rules reflects self-discipline, responsibility, and respect for others. Wentzel (2015) notes that students who internalize student character and behavioral norms tend to show higher levels of engagement and motivation. Moreover, Zimmerman (2013) argues that self-regulated behavior supports students' ability to manage their actions in structured environments. In extracurricular programs, rule compliance ensures the smooth implementation of activities and contributes to a safe and orderly learning atmosphere.

Responsibility is closely related to students' commitment to completing assigned tasks and fulfilling their roles within a group. Responsible behavior reflects maturity, perseverance, and accountability. According to Lickona (2012), responsibility is a core character value that supports moral and student character development. Similarly, Fullan (2016) emphasizes that responsible

learners are more capable of adapting to challenges and contributing to collective success. In extracurricular activities, responsible students demonstrate consistency in participation and performance, which enhances the overall effectiveness of the program and strengthens student character competence.

The research impact provide guidance for school principals, teachers, and extracurricular coordinators in designing and implementing science-based extracurricular programs that intentionally integrate character education with scientific inquiry. The study also offers practical examples of learning activities that encourage students to apply scientific knowledge while developing positive attitudes and behaviors. The research highlights the importance of utilizing extracurricular activities as an extension of classroom science learning. Schools can adopt similar programs to create meaningful learning experiences that promote both scientific literacy and character development, contributing to students' holistic growth in cognitive, affective, and social domains.

4. CONCLUSION

This study concludes that science-based extracurricular activities play a significant role in developing s, particularly in terms of cooperation, communication, empathy, rule compliance, and responsibility. These five indicators reflect essential competencies that support students' personal and student character development. Through active participation in extracurricular programs, students are encouraged to interact, collaborate, and adapt to group dynamics in constructive ways. This process contributes to the formation of positive character traits and strengthens interpersonal relationships among students. Furthermore, the results indicate that students who are actively involved in structured science-based extracurricular activities tend to demonstrate better student character behavior and higher levels of responsibility. The presence of clear rules, supportive supervisors, and collaborative learning environments facilitates the development of self-discipline and emotional awareness. Empathy and communication, in particular, help students build mutual understanding and resolve conflicts effectively. Therefore, science-based extracurricular activities function not only as complementary learning spaces but also as strategic platforms for character and student character development. Overall, the integration of student character development into extracurricular programs is essential for fostering well-rounded students who are academically competent and student character responsible. By continuously improving the quality and management of these activities, schools can maximize their potential in shaping students' character and preparing them for future academic and student character challenges.

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