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Bridging Campus and Classroom: Interactive Science Media Developed by Elementary Teacher Education Students to Foster Inspiring Science

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ABSTRACT

This study aims to describe the process and impact of developing interactive science media by students of the Elementary School Teacher Education (PGSD) program in primary school science learning. A descriptive qualitative approach with a collaborative-participatory research design was employed. The research subjects consisted of sixth-semester PGSD students and fourth- and fifth-grade students of SD Negeri 8 Juli. Data were collected through observation, interviews, documentation, and students' reflective journals, and analyzed using descriptive qualitative methods. The findings reveal that the media developed by the students - such as a solar system miniature, an electrical conductivity tester, and a science-themed board game - effectively enhanced students' engagement and understanding of science concepts. Moreover, the direct involvement of PGSD students in classroom media implementation strengthened their pedagogical and professional competencies as future teachers. Collaboration with school teachers also played a pivotal role in creating contextual, creative, and enjoyable learning experiences. These findings highlight the tangible contribution of student-developed media projects to improving the quality of science education in primary schools.

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1. Introduction

Science education plays a pivotal role in fostering critical, logical, and scientific thinking skills from the primary school level. Unfortunately, science instruction in elementary schools is still largely dominated by lecture-based and rote memorization methods, leading to low

student participation and poor conceptual understanding of scientific concepts (Sari & Rahmawati, 2022). This poses a serious challenge in preparing a generation that is literate in science and technology. In line with the demands of the Merdeka Curriculum, which emphasizes project-based and contextual learning, there is a pressing need for innovative instructional media that can connect science concepts to students' real-life experiences. Interactive media has emerged as an effective solution for increasing student interest and deepening their comprehension of subject matter (Nurhidayati & Utami, 2023). In this context, involving students from Elementary Teacher Education (PGSD) programs in the development of such media represents a strategic approach.

PGSD students have the potential to act as educational innovators, particularly in designing relevant and contextual learning media. Through coursework such as "Science Media Product Development," students are not only expected to grasp theoretical knowledge but also to create applicable classroom tools (Prasetyo, 2023). This activity encourages the application of scientific approaches tailored to learner needs. Recent studies show that interactive learning media can significantly enhance student motivation and learning outcomes, especially in science subjects (Wijayanti & Lestari, 2024). Observations from partner schools further support this, revealing that students become more active and enthusiastic when engaged with visual and hands-on media. Besides improving academic performance, interactive science media also promotes 21st-century skills such as collaboration, communication, creativity, and problem-solving (Hidayat, 2022). Students are no longer passive recipients of information but are encouraged to ask questions, experiment, and draw conclusions through learning activities.

Collaborative activities between PGSD students and elementary schools have proven to be a synergistic model with direct impact on classroom practices. Through observation, interviews, and reflective dialogue with teachers, students gain empirical insights that deepen their understanding of primary education (Ramdani & Fitria, 2023). This process also motivates teachers to adopt new media designed by students. According to the 2024 Report on Basic Education Progress in Indonesia, technology integration in elementary classrooms remains uneven, especially in rural areas. University-school partnerships through service learning and practicum programs are a strategic effort to bridge this gap (Kemdikbudristek, 2024). As such, student-led media development serves as a tangible contribution to improving the equity of educational quality. Notably, the science media created by students does not necessarily require advanced technology. In fact, the use of recycled materials, simple tools, and creative approaches can produce contextual, cost-effective media that align with the realities of primary schools (Anggraeni & Subekti, 2025). This demonstrates that limited resources are not a barrier to delivering inspiring science instruction.

The direct involvement of students in media development and classroom implementation also contributes to shaping their professional identity as future educators. They learn empathy, teamwork, and innovation as responses to real-world challenges (Salsabila, 2023). This aligns with the Merdeka Belajar–Kampus Merdeka initiative, which encourages students to engage with communities and the workforce early in their academic journey. Thus, the development of interactive science media by PGSD students is not merely an

academic exercise, but a formative experience in becoming adaptive, creative, and reflective teachers. These projects exemplify how students can bridge campus-based knowledge with classroom needs, bringing innovation that directly enhances the quality of science learning in elementary schools (Mulyadi, 2025).

2. Research Methodology

This study employed a descriptive qualitative approach with a participatory action research design, emphasizing active collaboration between PGSD (Elementary Teacher Education) students and elementary school teachers in the development of science learning media. This approach was chosen because it allows for an in-depth understanding of students' creative processes in designing educational media and its impact on classroom learning (Sari & Ramadhan, 2022). Furthermore, this research model aligns with the spirit of Merdeka Belajar–Kampus Merdeka, which promotes meaningful collaboration between universities and schools to foster innovative learning practices (Kemdikbudristek, 2023).

The research subjects included sixth-semester PGSD students enrolled in the Science Media Product course, as well as fourth- and fifth-grade students at SD Negeri 8 Juli, the partner school for the development activities. This site was selected based on a strategic partnership between the university and the elementary school to support field-based teaching experiences (Rohimah & Astuti, 2023). The school also demonstrated openness to the use of new media and provided institutional support for student-led media development initiatives.

Data collection techniques included observation, semi-structured interviews, documentation, and reflective student journals. Observations were used to record student engagement during the implementation of the media in the classroom, while interviews were conducted with both classroom teachers and student participants to gather their perceptions of the developed media. Documentation, such as photos, videos, and the physical products created by students, served as visual evidence to support the data analysis (Fitria & Wulandari, 2024). Additionally, students were asked to write reflective narratives throughout the planning, creation, and implementation phases, which were treated as narrative data for analysis (Pranata, 2022).

The research procedure involved several stages. The first stage was needs identification, in which students conducted preliminary classroom observations and held discussions with teachers to identify science topics that were difficult for students to grasp. The second stage was media design and development, where students created interactive media using simple materials, contextual technologies, or educational games tailored to the characteristics of elementary learners (Nugraha & Permatasari, 2023). The third stage was implementation, in which students applied the media directly in the classroom while serving as facilitators of learning. The final stage was evaluation and reflection, involving teachers, supervising lecturers, and students in assessing the effectiveness of the media and proposing improvements (Lestari, 2025).

Data analysis was carried out using descriptive qualitative methods through the stages of data reduction, data display, and conclusion drawing. Observation and interview data were

analyzed to identify patterns of student engagement, media effectiveness, and impact on conceptual understanding. All data were triangulated to enhance the validity of the findings by comparing observation results, teacher and student responses, and student reflections (Wahyuni & Andika, 2024).

This methodological approach was selected for its capacity to portray the full process—from the initial development of learning media to its real-world application in the classroom. The study aimed not only to produce functional educational media but also to provide reflective practice for students as future educators, integrating creativity, pedagogy, and contextual understanding of science (Putri & Hakim, 2025). Through this approach, the contribution of PGSD students to primary education becomes tangible and has a direct impact on the quality of science learning in elementary schools.

3. Results and Discussion

The development of interactive science media by PGSD students resulted in a variety of innovative products designed based on science topics for fourth and fifth grade, such as the circulatory system, the water cycle, animal classification, and the solar system. The students created media using simple, eco-friendly materials, including an electrical conductivity tester made from balloons and cardboard rollers, as well as science-themed board games featuring interactive question cards. These instructional tools not only enhanced conceptual visualization but also significantly increased students' active participation in learning activities (Prasetyo & Kurniawan, 2022).

Observational data revealed a notable increase in student engagement during the learning process. Students showed greater enthusiasm when given opportunities to touch, manipulate, or operate the media directly. These hands-on activities facilitated two-way interactions between teachers and students, as well as among students themselves. According to interviews with classroom teachers, the media developed by the students helped explain concepts that were previously difficult for students to grasp through traditional lecture methods (Rahayu & Laili, 2023).

Furthermore, media-based interactive learning positively impacted students' understanding of science concepts. This was evident in post-lesson oral assessments, where the majority of students were able to respond with more accurate and coherent explanations compared to previous sessions. This finding is consistent with the study by Wahyuni & Damanik (2024), which emphasized the role of interactive media in reinforcing conceptual understanding through direct learning experiences (learning by doing).

The following are examples of student-developed media products that were applied in the classroom and contributed to improving students' comprehension of science topics:

(2)

(2)

(3)

(4)

Figure 1. PGSD Students Collaborating with Elementary School Pupils

From the students' perspective, the media development process served as a meaningful learning experience. They not only honed their creativity and technological skills but also learned to adapt to the real conditions of elementary schools, including limited resources and the unique characteristics of young learners. Many students reported an increase in their confidence when teaching, as the media they developed functioned effectively as instructional aids (Fitriani & Salsabila, 2024). This experience significantly strengthened their pedagogical and social competencies as prospective teachers.

Collaboration with classroom teachers emerged as a crucial factor in the success of this initiative. Teachers did not act merely as facilitators but also served as reflective partners who provided constructive feedback on the design and implementation of the media. According to Lestari and Mulyadi (2025), such collaborative engagement fosters the emergence of contextual and sustainable instructional innovations. Teachers were also inspired to develop their own teaching media beyond the scope of this program.

Overall, the results indicate that interactive science media developed by PGSD students had a positive impact on science instruction in elementary schools. This initiative not only enriched the variety of teaching methods used in the classroom but also created a reflective and collaborative space among students, teachers, and university lecturers for building more creative and contextual learning environments. It aligns with the broader effort to establish student-centered primary education that supports the holistic development of learners (Kemdikbudristek, 2024).

Thus, the development of interactive science media by PGSD students should not be viewed merely as an academic task, but as a concrete contribution to the transformation of primary school learning. This initiative embodies the spirit of 21st-century education, which emphasizes creativity, collaboration, and sustainability (Anggraeni, 2025). Through such efforts, the gap between university-based learning and classroom realities is bridged, fostering mutually reinforcing educational experiences.

4. Conclusion

The development of interactive science media by PGSD students demonstrates that collaboration between universities and elementary schools can lead to Mhvvg ore inspiring, contextual, and meaningful learning experiences. The media designed by students has been proven to enhance student engagement in science lessons, reinforce understanding of scientific concepts that were previously considered abstract, and foster a more active and enjoyable classroom environment. PGSD students did not merely act as media creators; they also served as learning facilitators who directly implemented their innovations in the classroom. This process provided a valuable platform for developing essential pedagogical, creative, and reflective competencies as future educators. On the other hand, classroom teachers also gained inspiration and motivation to explore more interactive and collaborative instructional approaches.

References

Anggraeni, L., & Subekti, A. (2025). The use of recycled materials as environmentally-based instructional media in elementary schools. Journal of Elementary Education Innovation, 7(1), 55–64.

Anggraeni, M. (2025). Campus-school collaboration in developing interactive media based on local wisdom. Journal of Collaborative Education, 3(1), 12–21.

Fitria, D., & Wulandari, R. (2024). Documentation as a validation tool in classroom action research. Journal of Educational Methodology, 6(2), 87–95.

Fitriani, N., & Salsabila, R. (2024). Improving the self-confidence of PGSD students through instructional media development practice. PGSD Educreative Journal, 5(1), 29–37.

Handayani, S., & Yusuf, A. (2023). Solution-based learning using simple media in elementary education. Journal of Child Education Science, 4(2), 44–53.

Hidayat, M. (2022). Integrating 21st-century skills in primary science education. Journal of Innovative Elementary Education, 2(1), 13–22.

Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. (2023). Guidelines for the Implementation of the Merdeka Curriculum in Primary Education. Directorate General of Primary Education.

Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. (2024). Indonesia Basic Education Progress Report 2024. Directorate General of Early Childhood, Primary and Secondary Education.

Lestari, D., & Mulyadi, R. (2025). Collaborative practices between students and teachers in contextual instructional innovation. Journal of Educational Partnership, 5(2), 70–80.

Nurhidayati, S., & Utami, L. (2023). Interactive media to increase science learning motivation among elementary students. Journal of Basic Learning Media, 3(2), 24–33.

Nugraha, T., & Permatasari, W. (2023). Designing educational media based on science games for school-aged children. Journal of Innovative Learning Media, 2(3), 15–22.

Pranata, H. (2022). Reflection as an evaluation method in teacher professional development programs. Journal of Educational Evaluation, 1(1), 41–50.

Prasetyo, A. (2023). Student-created science media as a strategy for meaningful learning. Journal of Basic Science Education, 3(1), 18–27.

Prasetyo, A., & Kurniawan, B. (2022). Innovation in science instructional media for elementary students through activity-based approaches. Journal of Creative Science Learning, 4(2), 66–74.

Putri, A., & Hakim, F. (2025). Professional reflection among pre-service teachers through microteaching activities. Journal of Basic Teacher Education, 7(1), 48–59.

Rahayu, S., & Laili, M. (2023). Effectiveness of visual media in elementary science learning. Journal of Elementary Media and Learning, 5(2), 71–79.

Ramdani, D., & Fitria, N. (2023). Empirical experiences of PGSD students in school partnership activities. Journal of Teacher Professional Education, 2(2), 101–109.

Rohimah, I., & Astuti, S. (2023). Campus-school partnerships in field teaching practice. Journal of Applied Education, 4(1), 56–65.

Salsabila, T. (2023). Professional character of future teachers: A study on PGSD students. Journal of Teacher Education Ethics, 1(1), 39–47.

Sari, M., & Rahmawati, L. (2022). Common problems in elementary science learning. Journal of Elementary Education Issues, 1(2), 10–20.

Wahyuni, R., & Andika, A. (2024). Data triangulation in qualitative research on elementary education. Journal of Educational Methods and Evaluation, 6(1), 36–44.

Wahyuni, R., & Damanik, A. (2024). The impact of interactive media on elementary students' science concept comprehension. Journal of Science Education Research, 4(3), 25–34.

Wijayanti, E., & Lestari, T. (2024). The role of instructional media in improving science learning outcomes. Journal of Interactive Elementary Learning, 3(1), 58–66.