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Constructing hope in the Katingan River: A phenomenological analysis

Rendi Indiwara

SMKN 1 Kasongan, Katingan, Kalimantan Tengah, Indonesia
e-mail: rendiindiwara3@gmail.com

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ABSTRACT

This phenomenological study examined the lived experiences of vocational high school students engaged in a project-based learning effort designed to alleviate water pollution in the Katingan River through the application of Arduino and Internet of Things (IoT) technology. The research demonstrates a significant transformation in student engagement, evolving from initial bewilderment and reliance on instructor directives to collaborative discovery, peer mentoring, and critical inquiry through observation, recording, and reflective assessment. The study employs Colaizzi's approach to data analysis to demonstrate that interactive media and experiential learning enhance technical proficiency, ecological consciousness, social accountability, and a profound sense of ownership in the learning process. Reflection served as the fundamental process by which students derived meaning, linking technical work to real-world difficulties and community influences. The results highlight the necessity of incorporating structured reflection into vocational education to foster significant, human-centered, and transformative learning experiences.

Keywords: arduino, IoT, phenomenology, project based learning, reflection

1. INTRODUCTION

The world of education is confronted with a new challenge in the face of the complex nature of environmental issues and the rapid advancement of technology: how to provide learning that not only instills technical skills but also fosters reflective awareness and social responsibility among students. A viable solution to this difficulty is project-based learning (PjBL), which is rooted in local contexts and augmented by technology. Nonetheless, this form of learning will merely devolve into a technical routine if it lacks opportunities for students to contemplate, introspect, and derive meaning from each step they undertake (Hartanti et al., 2024).

Reflection is essential for converting experiences into meaningful learning. Through reflection, students uncover not only the methods employed in completing a project but also its significance, its impact on themselves and society, and how the experience has transformed their perspectives. Reflection connects action and comprehension, which is a vital element of 21st-century education. Research indicates that reflection enhances students' metacognitive awareness, reinforces the relationship between theory and practice, and catalyzes a shift in their worldview (Mello et al., 2021).

This scenario is significantly pertinent to the educational methodologies at SMKN 1 Kasongan, Central Kalimantan, which is immediately faced with the issue of water contamination in the Katingan River resulting from household garbage and illicit mining operations. In a project aimed at mitigating water pollution, students were tasked with designing a water quality monitoring device utilizing an Arduino microcontroller and an Internet of Things (IoT) platform (Zulkifli et al., 2022). They acquire skills in sensor assembly and digital data processing, engage with their environment, investigate community issues, and contemplate their responsibilities as an ecologically conscious generation (Tauhid & Arini, 2024).

The process was engaging not only because of the students' technical proficiency in developing a functional tool, but also in their articulation of the feelings, emotions, and insights that arose during the project. Discussions, project journals, and interviews indicated that for certain students, this project was their initial experience of perceiving the applicability of their academic learning to their community (Kim, 2019). The project heightened awareness among some that technology can serve the common good, rather than solely industrial purposes (P. L. Mello & Gravett, 2025).

This research used an interpretive phenomenological approach to explore the significance of these encounters. In what manner do students comprehend the projects they engage in? What values do they uncover during this process? How do their reflections influence novel viewpoints on education, technology, and the environment? This study provides an overview of the efficacy of IoT-based initiatives in vocational education and underscores the significance of reflection as central to humane and transformative learning experiences.

2. METHOD

This study posits that learning experiences cannot be comprehensively understood solely through numerical data, scores, or product outcomes. Indeed, the underlying classroom dynamics, student discourse, and reactions to technical difficulties are human significances imbued with instructional and emotional value. This study employed an interpretive phenomenological technique to examine these meanings, focusing on students' subjective experiences.

This study was conducted at SMKN 1 Kasongan, Central Kalimantan, as part of a water pollution reduction initiative utilizing Arduino and the Internet of Things (IoT). Five students from the 10th grade of Audio Video Engineering served as primary participants. They were not merely participants in the learning process; they animated this endeavor through their thoughts, emotions, and personal reflections. These five students were selected because of their active engagement throughout the project, encompassing the problem identification phase to the reflection and presentation of results.

Throughout the five-week educational period, the researcher, who also served as an instructor, was actively engaged in classroom interactions. All interactions, both within and beyond the classroom, constituted an essential component of the study data landscape. The researcher gathered data via participant observation, documenting students' reactions, discourse, and attitudes as they encountered technical and social hurdles throughout the project. This observation was accomplished through direct engagement, sharing both space and time with the children.

Along with observation, documentation constitutes an essential component of data collection. Images of activities, application screenshots utilized by students, digital diaries they produce, and infographics from projects not only enhance reports but also provide visual proof of their cognition and reflection. Each photograph and note narrates a tale—concerning achievements, challenges, compromises within the team, and the minor instances that influence significant experiences.

Teacher-administered project evaluations serve to evaluate students' technical proficiency and are also examined as reflecting artifacts. Assessment rubrics, encompassing indicators of critical thinking, creativity, collaboration, and communication, elucidate how students manifest their understanding of learning through tangible actions: their collaboration, role-sharing, idea articulation, and response to failure within the learning process.

The Colaizzi technique, an analytical methodology in phenomenology, was employed to examine the complete dataset and elucidate the core of human experience (Praveena KR & Sasikumar S, 2021) (Park, 2017). The procedure commences with a comprehensive review of all notes and paperwork, identifying significant statements, and subsequently interpreting the meaning of each statement. The meanings are further categorized into overarching themes that represent the students' shared experiences (Gumarang Jr. et al., 2021).

A detailed account was subsequently assembled, not just to narrate the events but also to convey the pupils' emotional experiences. The concluding phase was validating the findings with the participants via open dialogue. Several students contributed further narratives, elucidated meanings, and referenced topics they had not previously documented (Gumarang Jr. et al., 2021). This technique yields a narrative detailing the project's success while also providing a comprehensive depiction of students' overall learning experiences, characterized by curiosity, frustration, hope, and an enhanced awareness of their surroundings and their identities as learners.

3. RESULT AND DISCUSSION

3.1 Result

Initially, students exhibited significant reluctance and uncertainty over the project. They looked to lack a complete understanding of the learning objectives, and the majority appeared to favour awaiting guidance from the teacher instead of proactively engaging in the exercises. This was evident in their restricted engagement, characterised by unilateral directives from the instructor throughout learning tasks. Students mostly adhered to the prescribed flow, exhibiting minimal inquiry or deeper exploration of the content. One pupil, referred to as F, exhibited markedly greater passivity than his counterparts. F seemed to have difficulty articulating his comprehension of the subject matter and occasionally appeared perplexed by the tools employed. He chose to adhere to the tempo of his contemporaries, refraining from taking any own actions. In this context, F had not yet exhibited confidence and ease with the subject or the learning environment, suggesting he was still acclimating to the project-based learning approach being utilised. It is anticipated that, over time, students such as F will become more active and engaged in the learning process as chances for personal investigation and reflection arise.

Substantial changes commenced when educators implemented interactive learning media. This afforded pupils the opportunity to investigate the topic autonomously, facilitating their learning through captivating visual methods. The implementation of simulations and dynamic visual displays provided new insights for students who may have previously felt constrained by the constraints of verbal explanations or abstract notions. Their interest commenced a significant escalation. Formerly docile students began to exhibit more curiosity. They not only initiated enquiries regarding concepts they found perplexing but also ventured to use novel methodologies for accomplishing tasks. Moreover, student conversations intensified, with individuals exchanging ideas and investigating potential project concepts in a more open and innovative fashion. This interactive media appeared to be a significant catalyst for fostering proactive and collaborative attitudes among students, equipping them with tools to comprehend the topic more profoundly and refine their critical thinking abilities.

In the classroom dynamics, a student emerged as a catalyst, R. He not only addressed the teacher's challenge but also promptly took the initiative to formulate a plan for mitigating river water pollution. R successfully formulated a logical and comprehensible solution, allowing both himself and his peers to comprehend his reasoning. Moreover, R shown maturity in leadership abilities by directing his peers. He meticulously reiterated directions that may not have been comprehended, offered comprehensive elucidations of the assignment, and assisted the group in grasping the purpose of each tool utilised in the project. R's presence established him as the unofficial learning hub of the class. Despite his significant role, R did not assert himself as a dominant figure; rather, he remained helpful and nurturing. He assisted his pupils in overcoming challenges and fostered active thinking and discussion, cultivating a collaborative environment that enhanced the learning experience. Consequently, R exemplifies how a student can assume the position of an informal leader, enhancing the efficacy and depth of learning for all group participants.

Nevertheless, the educator recognized that academic achievement is not determined by the proficiency of a single student, but by the collective engagement and meaningful navigation of the learning process by all pupils. In this sense, student M is a noteworthy individual. He was not as adept at comprehending the technical facets of the project as R, however he had a robust eagerness to learn. He assisted to the best of his ability, inquired of his colleagues, and remained informed about the project's advancement. The relationship between R and M exemplified genuine collaboration—characterized by complementary rather than competition. The initiative evolved into a communal environment where participants supported one another and developed collectively. Concurrently, student F2 was assigned a specialized task involving programming using the Arduino IDE. He experienced significant challenges during this stage, and asked the teacher for help several times. Nonetheless, this limitation prompted a moment of important inquiry: he inquired, "Can IoT be utilized on a mobile phone, rather than solely on a laptop?" This inquiry initiated a classroom discussion regarding the adaptability of technology utilization and illustrated that critical thought can emerge from confronting technical challenges.

The culmination of anticipation occurred when the completed apparatus functioned successfully. The temperature and TDS data displayed seamlessly on the screen. The students applauded, their expressions radiating pride and contentment. For Student F, who had faced difficulties from the outset, this time was crucial. He believed that his endeavors had been valuable. It was an epiphany that transcended mere technicality; the pupils recognized their own capabilities and their potential to do something substantial and meaningful. Fieldwork along the Katingan River significantly enhanced student involvement. Extracurricular learning became more dynamic. Student A undertook the responsibility of documenting all activities, whilst Student M noted the measurements. Other students alternated in measuring the water's total dissolved solids at various depths. The collective enthusiasm fostered a goal-oriented collaborative learning environment. They had transcended the label of "students" and were now "junior researchers" engaged in a practical environment.

In the concluding phase, all students were afforded the opportunity to submit their project findings via presentations. All students actively participated, eagerly voicing their thoughts and engaging with one another, showcasing an increasing confidence derived from the practical experience gained during the project. Every student eagerly presented their discoveries and concepts, indicating a notable shift in their perspectives on learning. During the reflection session, student A articulated a notably perceptive perspective. He proposed that water quality assessments be conducted at additional locations to yield a more thorough understanding of the analysed water conditions. Additionally, student R stated that the project's equipment may be enhanced by incorporating a pH sensor to assess the water's acidity, thereby yielding more comprehensive and precise data. These suggestions indicate that students have evolved beyond merely fulfilling homework to becoming more innovative thinkers. They comprehend the principles and are receptive to further development and enhancement. These reflections demonstrate that students have achieved considerable advancement in critical and inventive thinking, and recognise the possibility for further enhancement of their acquired knowledge. This demonstrates a profound comprehension and an anticipatory strategy towards practical issues.

This method illustrates that project-based learning emphasises the cultivation of technical skills while simultaneously enhancing ecological awareness, social empathy, collaborative abilities, and the audacity to enquire and innovate. These projects enable students to acquire practical problem-solving skills while fostering an understanding of the significance of ecosystem balance and their responsibility in nature conservation. Moreover, they cultivate empathy for their surrounding social and environmental problems, as numerous ideas they conceive arise from a motivation to effectuate positive change. This project-based learning fosters robust collaborative principles, as students engage in teamwork, exchange ideas, and appreciate one another's efforts. Reflection is an essential component of this process, functioning as a conduit for students to comprehend the experiences acquired throughout the project. Through reflection, students comprehend both the final outcome and the journey they have experienced. This transforms their experience from a mere educational exercise into a more genuine and significant trip, imparting essential insights about themselves, their surroundings, and their interactions with the world. This project-based learning imparts technical information while also cultivating essential character traits and attitudes for their future endeavours.

3.2 Discussion

Students' experiences in project-based learning on water pollution mitigation with Arduino and IoT indicate that the essence of learning is not exclusively defined by technical achievement, but rather evolves from reflection on the process. Learning serves as a domain for interactions among challenges, curiosity, peer assistance, and the significance of the surrounding context. This is where learning manifests in its most human form as a process of transformation and comprehension (Chowdhury, 2016).

Initially, students seemed reliant on the instructor. They exhibited passivity when they lacked comprehension of the activity's direction. Nonetheless, when provided with the opportunity to engage through interactive learning media, a proactive reaction manifested, signifying a transformation in learning consciousness. This illustrates that critical thinking can alter one's viewpoint on experiences, serving as a catalyst for transformative learning (Tiessen, 2018). The learning media served as a catalyst for reflection, encouraging students to inquire, experiment, and engage with the subject autonomously (Kuk & Holst, 2018).

The emergence of individuals such as student R in educational settings illustrates the existence of inherent leadership within a collaborative learning environment. Nonetheless, it is not solely about the preeminent role of individuals, but rather how the educational environment facilitates the encouragement of pupils like M, who were previously unremarkable, to evolve and progress. This corresponds with Vygotsky's perspective that learning transpires socially inside the zone of proximal development, where more proficient pupils support their less experienced counterparts (Erbil, 2020). Students' collaborative experiences, mutual assistance, and collective comprehension provide as tangible illustrations of sociocultural learning within the classroom (Kahlke et al., 2019). Project-based learning emphasizes the need of teamwork among students. In a project focused on water pollution prevention utilizing Arduino and IoT, students collaborated in groups, facilitating knowledge exchange, enhancing comprehension, and engaging in the discourse of innovative concepts. This teamwork enabled students to acquire knowledge not just from the instructor but also from their classmates. For example, in certain groups, students with more technological knowledge aided those who were less experienced. This substantiates Vygotsky's perspective of learning as a social phenomenon, wherein interpersonal connection is important to students' cognitive advancement. Through mutual assistance, pupils surmounted technical obstacles and expedited their comprehension of the educational content.

The integration of technology in the educational process significantly enhances student creativity. When students utilize IoT-based sensors and tools, they grasp theoretical concepts while simultaneously engaging in practical applications. Initially perceived as unattainable, technology ultimately evolves into a versatile instrument tailored to students' learning requirements. This illustrates that educational technology can elevate student engagement, broaden resource accessibility, and cultivate confidence in addressing technical challenges. Furthermore, technology enriches student interactions with learning materials, rendering them more pertinent and meaningful to their everyday experiences.

Reflection is essential for connecting technical expertise with personal insight. When F2 students inquire, "Is IoT applicable on a mobile phone?", it transcends a mere technical query, embodying a manifestation of critical thinking derived from practical experiences. In a reflective learning framework, exemplified by Schön, acts like questioning, comparison, and suggesting alternative answers constitute reflection-in-action, enabling students to respond directly and adaptively to learning contexts (Ramage, 2017). These inquiries illustrate that students are increasingly perceiving technology not as an alien entity, but as a resource that can be tailored to their requirements and capabilities.

A profound emotional experience was elicited upon the successful testing of the gadget. The students' enthusiasm, particularly that of Student F, who had previously faced challenges, illustrated that the essence of learning resides not alone in the result, but also in the process. The sensation of "I can accomplish this" that arose when the tool functioned was a transforming experience—commonly termed an aha moment (Illeris, 2014). The essence of learning is realized when students perceive that their efforts have yielded results, transforming their information into something vibrant and palpable. The significance of emotional engagement in learning is further underscored within the framework of this project. When students effectively evaluate the tools they have developed, the emotional responses they encounter arise not solely from technical achievement but also from the personal gratification derived from that success. This emotionally engaging educational experience fosters a profound connection between students and the subject matter they are studying. Emotional learning theory posits that emotions significantly enhance memory retention and comprehension. Students who feel good emotions associated with learning are more inclined to retain and comprehend the subject well (Kahlke et al., 2019).

Fieldwork in the Katingan River enhances students' perspectives through genuine context. The river has transcended its status as an object, becoming a subject that compels contemplation, observation, and response. Extracurricular learning enhances engagement, stimulates curiosity, and cultivates pupils' emotional ties to the environment (Payne, 2018). In an ecopedagogical framework, emotional connection with nature is essential for cultivating ecological consciousness. Students not only quantify TDS but also cultivate an appreciation for, concern for, and comprehension of the significance of water quality in their daily lives (Rodrigues, 2018). Fieldwork conducted at the Anak Katingan River provided authentic experiences that enriched student learning. This out-of-classroom learning focused not only on technical skills but also encompassed a deeper ecological understanding. Students went beyond measuring TDS (Total Dissolved Solids) or water pH; they began to relate the results to broader environmental impacts. This demonstrated the application of ecopedagogy, which emphasizes the interconnectedness of education, the environment, and social awareness (Payne, 2018). By directly observing river conditions, students developed an ecological awareness that could lead to future conservation actions. This provides a strong foundation for developing students' character and commitment to environmental sustainability.

The last presentation and reflection session illustrated that the learning had elevated students' cognitive processes to a more intricate level. Student A's proposal to increase measurement points and Student R's recommendation to incorporate a pH sensor exhibited not just their comprehension of the equipment but also their capacity for systematic thinking and commitment to continual enhancement. This illustrates that the learning has surpassed the classroom and began to involve their scientific consciousness and social accountability. Reflection is an essential component of project-based learning. Students are encouraged to reflect on their experiences and the lessons acquired both during the learning process and after the project's completion (Ramage, 2017). This allows individuals to discern strengths and flaws in their learning process and strategize enhancements. This continuous reflection aids students in evolving beyond just technical skills to encompass critical thinking and social responsibility (Widiastuti, 2022). Students' recommendations for enhancing tools or optimizing measuring points indicate that their learning has progressed to a more sophisticated, systemic thinking process. This signifies that project-based learning has effectively cultivated pupils who comprehend the content and can also contemplate subsequent advancements.

Consequently, project-based learning is not only technically effective but also involves students' emotional, social, and introspective aspects. These programs facilitate the development of holistic learners who possess critical thinking skills, collaborative abilities, environmental stewardship, and the capacity to derive personal meaning from their educational experiences.

4. CONCLUSION

The students' involvement in an Arduino- and Internet of Things-focused water pollution mitigation project at SMKN 1 Kasongan illustrates that significant learning arises not merely from technical achievement, but from the reflective processes undertaken both individually and collaboratively by the students. Students evolve from merely adhering to instructions into proactive learners who inquire, experiment, assist, and finally comprehend that they are addressing real-world challenges within their own surroundings.

The significance of learning becomes apparent when students comprehend that their creation transcends a mere electrical device; it embodies a commitment to safeguarding the river, preserving the environment, and protecting life. They directly encounter collaboration, confront failure, achieve achievement, and perceive these experiences as integral to their development as individuals and citizens. In this process, technology serves as a means rather than an ultimate goal. Conversely, discourse, collaboration, and introspection foster significant learning.

Minor instances such as pivotal inquiries, the audacity to address the class, and the exhilaration of witnessing a tool function constitute a milestone that eludes quantification yet is perceptible in the transformations of students' attitudes and viewpoints. They acquire knowledge not only of sensors, data, and programming, but also of responsible thinking, feeling, and action.

The core of this learning lies not in the ultimate product individuals create, but in the significance they derive from their educational experiences. This encapsulates the core of soulful education—an educational approach that cultivates knowledge and awareness, skills and empathy, ultimately transforming students into not only learners but also thoughtful, compassionate, and purposeful individuals.

Ethical Approval

Ethical approval was not required for this study

Informed Consent Statement

Not Applicable

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data Availability Statement

The data presented in this study are available on request from the corresponding author due to privacy reasons.

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Notes on Contributors

Rendi Indiwara

Rendi Indiwara is affiliated SMKN 1 Kasongan, Katingan, Kalimantan Tengah, Indonesia

REFERENCES

Chowdhury, M. (2016). Emphasizing Morals, Values, Ethics, And Character Education In Science Education And Science Teaching. *The Malaysian Online Journal of Educational Science*, *4*(2).

Erbil, D. G. (2020). A Review of Flipped Classroom and Cooperative Learning Method Within the Context of Vygotsky Theory. In *Frontiers in Psychology* (Vol. 11). Frontiers Media S.A. https://doi.org/10.3389/fpsyg.2020.01157

Gumarang Jr., B. K., Mallannao, R. C., & Gumarang, B. K. (2021). Colaizzi's Methods in Descriptive Phenomenology: Basis of A Filipino Novice Researcher. *International Journal of Multidisciplinary: Applied Business and Education Research*, *2*(10), 928–933. https://doi.org/10.11594/ijmaber.02.10.10

Hartanti, J., Hasiana, I., & Firda Mufidah, E. (2024). *EFEKTIVITAS MODEL PEMBELAJARAN BERBASIS PROJECT (PBL) UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KRITIS REFLEKTIF PADA MAHASISWA* (Issue 2).

Illeris, K. (2014). Transformative Learning and Identity. *Journal of Transformative Education*, *12*(2), 148–163. https://doi.org/10.1177/1541344614548423

Kahlke, R., Bates, J., & Nimmon, L. (2019). When I say … sociocultural learning theory. *Medical Education*, *53*(2), 117–118. https://doi.org/10.1111/medu.13626

Kim, M. K. (2019). Reflective Practice in Project-based Culture Learning: Content and Quality of Reflection. *English Language Teaching*, *31*(4), 67–94. https://doi.org/10.17936/pkelt.2019.31.4.4

Kuk, H. S., & Holst, J. D. (2018). A Dissection of Experiential Learning Theory: Alternative Approaches to Reflection. *Adult Learning*, *29*(4), 150–157. https://doi.org/10.1177/1045159518779138

Mello, P. L., & Gravett, S. (2025). Pre-service teachers' views of an ideal teacher for a fast-changing world. *Perspectives in Education*, *43*(1), 82–98. https://doi.org/10.38140/pie.v43i1.8629

Mello, L. V., Varga-Atkins, T., & Edwards, S. W. (2021). A structured reflective process supports student awareness of employability skills development in a science placement module. *FEBS Open Bio*, *11*(6), 1524–1536. https://doi.org/10.1002/2211-5463.13158

Park, J. K. (2017). Experience of frailty in Korean elderly: A phenomenological study utilizing the colaizzi method. *Journal of Korean Academy of Nursing*, *47*(4), 562–574. https://doi.org/10.4040/jkan.2017.47.4.562

Payne, P. G. (2018). The framing of ecopedagogy as/in scapes: Methodology of the issue. In *Journal of Environmental Education* (Vol. 49, Issue 2, pp. 71–87). Routledge. https://doi.org/10.1080/00958964.2017.1417227

Praveena KR, & Sasikumar S. (2021). Application of Colaizzi's Method of Data Analysis in Phenomenological Research. In *Medico-legal Update* (Vol. 21, Issue 2).

Ramage, M. (2017). Learning and change in the work of Donald Schön: Reflection on theory and theory on reflection. In *The Palgrave Handbook of Organizational Change Thinkers* (pp. 1159–1172). Springer International Publishing. https://doi.org/10.1007/978-3-319-52878-6_57

Rodrigues, C. (2018). MovementScapes as ecomotricity in ecopedagogy. *Journal of Environmental Education*, *49*(2), 88–102. https://doi.org/10.1080/00958964.2017.1417222

Tauhid, K., & Arini, ; | Bogor. (2024). *Inovasi Sumber Belajar Berbasis Proyek (Project Based Learning)* (Vol. 3).

Tiessen, R. (2018). Improving Student Reflection in Experiential Learning Reports in Post-Secondary Institutions. *Journal of Education and Learning*, *7*(3), 1. https://doi.org/10.5539/jel.v7n3p1

Widiastuti, S. (2022). Pembelajaran Sosial Emosional Dalam Domain Pendidikan: Implementasi Dan Asesmen. *Jurnal Pendidikan Mandala*, *7*(4), 964–972. http://ejournal.mandalanursa.org/index.php/JUPE/index

Zulkifli, C. Z., Garfan, S., Talal, M., Alamoodi, A. H., Alamleh, A., Ahmaro, I. Y. Y., Sulaiman, S., Ibrahim, A. B., Zaidan, B. B., Ismail, A. R., Albahri, O. S., Albahri, A. S., Soon, C. F., Harun, N. H., & Chiang, H. H. (2022). IoT-Based Water Monitoring Systems: A Systematic Review. In *Water (Switzerland)* (Vol. 14, Issue 22). MDPI. https://doi.org/10.3390/w14223621