



Khondokar Sabera Hamid¹ 

South Point School and College,
Dhaka, Bangladesh

**Original
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Environmental Awareness Through Project-Based Learning in Primary Social Science Classrooms in Dhaka: A Qualitative Analysis

Summary: *The impact of project-based learning on enhancing environmental consciousness among elementary school pupils in a Dhaka school and encouraging a culture of lifelong learning among teachers is investigated in the present study. The study emphasizes four pollution types—air, water, soil, and sound—demonstrating that project-based learning enhances pupil education and increases teacher professionalism. The accessible school, recognized for its innovative science education, served as the research site.*

The main source of data was interviews with teachers, which were supplemented by pupil comments and classroom observations. The interviews encompassed contributions from four social science teachers, sixteen teachers of various subjects, and a head teacher, exploring their pedagogical practices, obstacles, and views on the effects of project-based learning. While pupil perspectives demonstrated personal development and increased environmental responsibility, observations showed trends of pupil participation as well as understanding of environmental issues.

Research indicates that teacher lifelong learning is greatly enhanced by project-based learning, which also promotes collaboration and creative teaching methods. Teachers indicated an increase in reflection and engagement in their pedagogical methods, employing project-based learning to enhance their competencies and respond to emerging difficulties. This method not only enhanced their pedagogical efficacy but also reinforced their dedication to continuing professional development. Pupils demonstrated an enhanced understanding of pollution through collaborative projects, demonstrating the benefits of teamwork and collective problem-solving.

¹ emakhshamid@gmail.com;

 <https://orcid.org/0000-0003-2029-8492>

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The study promotes structured professional development focused on project-based learning, emphasizing its significance in improving environmental education and fostering a culture of lifelong learning among teachers. Despite obstacles such as constrained resources and time, the study emphasizes that project-based learning may result in significant transformations in pedagogy and learning outcomes. Finally, it argues that by fostering critical thinking and responsible citizenship, project-based learning produces a mutually beneficial growth cycle that benefits both teachers and pupils.

Keywords: *project-based learning, environmental awareness, primary education, lifelong learning, teachers' professional development*

Introduction

This research explores how project-based learning nurtures a culture of lifelong learning amongst the teachers as well as improves the environmental consciousness of primary pupils in a school in Dhaka city. It specifically looks at four main pollutants, which are air, water, soil, and sound pollution. The relevance of the study is that project-based learning not only enhances learners but also increases the professionalism of teachers. The selected school is most accessible and has a reputation for innovative teaching of the sciences. The study also uses lifelong learning as the most important way to show how project-based learning empowers teachers to become reflective practitioners since they must continuously improve their teaching practices for the dynamic development of their learners. It has given many critical professional skills, such as collaboration, problem-solving, or innovative pedagogy, to teachers participating in project-based learning. Through an iterative process of planning, implementing, and reflecting on their learners, this process improves their pedagogical practice as well for lifelong education.

In this research, the primary sources of data were teacher interviews, supplemented by classroom observation and reflection of pupils. The teacher interviews comprised four social science teachers, sixteen other-subject teachers, and a head teacher. They were asked about their teaching strategies, the challenges they faced, and what they regard as the impacts of the project-based learning activi-

ties. The classroom observations patterned pupil involvement, engagement, and understanding of environmental matters, while reflection from pupils indicated individual growth, environmental awareness, and responsibility.

The findings indicate that project-based learning is the only means through which lifelong learning occurs among teachers, through collegiality, inventive pedagogies, and flexible approaches. They indicated that they had become reflective and active in teaching practice. They indicated they were utilizing project-based learning for deepening their skills, followed by the opening of new horizons beyond the classroom walls. Continuation with project-based learning helps the development of a growth-oriented mindset among teachers who learned to regard obstacles as avenues for improving their practice and knowledge. Also, this process has led not only to an increased effectiveness in designing good learning experiences, but also to a positive impact on commitment to the continuing professional development.

On the other hand, pupils showed broader knowledge about pollution and its repercussions than it would have been revealed by individual work through teamwork, poster-making, and jointly proposing public action solutions to address environmental issues. All these outcomes, therefore, signify that project-based learning creates a mutually reinforcing loop of growth, whereby the lifelong learning of teachers creates success among pupils, while the active participation of pupils inspires further innovation in teaching practices.

This research combines mutual learning, from which both pupils and teachers can benefit, with a reference to problem-based learning. In order to show that even with limited resources and time, a few teachers can actually be engaged in project-based learning which can create a big difference in the process of change and innovation that would last beyond barriers. Above all, the research has recommended systematic, programmed, continuing professional development focused on project-based learning approaches, resources, and collaborative networks to enhance these developments. The research recommends not only enhancing environmental education, but also fostering a culture of lifelong learning among educators, which can enhance teaching efficiency and improve pupil outcomes.

Once again, we conclude that project-based learning benefits both pupils and teachers through a mutual learning experience. Even under the hardships of the scarce resources, time, and other variables, through active engagement with project-based learning, teachers would seem to display their bounding need for space, growth, and innovation. In addition to making teaching more effective, this study suggested a number of things that should be included in a proper systematic continuing professional development program on project-based learning approaches, resources, and collaborative networks. This would strengthen social science and environmental education and encourage teachers to keep learning throughout their careers.

Environmental education encourages responsible citizenship, thereby facilitating the concept of sustainable existence. In a primary school setting, by engaging children in meaningful learning about environmental issues, one can greatly influence their attitudes and behaviors. Project-Based Learning may be defined as an instructional strategy that enhances deep learning, critical thinking, and problem-solving skills. This study attempts to investigate the role of the project-based learning in enhancing environmental awareness among prima-

ry pupils, while contributing to teacher professional development and lifelong learning.

The site for the study was a reputed primary school in Dhaka, known for innovative teaching practices. The proposed integration of the project-based learning in social science education was to study its effects on pupil engagement and teacher development. The study further investigates the challenges teachers face when implementing project-based learning, as well as the ways to address them through continuing professional development.

Qualitative methods employed by the researcher included classroom observation and semi-structured interviews with teachers. The findings indicate that hands-on, collaborative projects addressing local environmental issues promote the development of critical thinking skills and a sense of responsibility in pupils. Teachers reported feeling more motivated and using improved teaching strategies since they adopted project-based learning. Therefore, continuing professional development is considered a vital strategy to equip teachers with skills and confidence for appropriate implementation. Thus, this study advocates project-based learning as a vehicle in primary education to foster environmental activities and continuous teacher development.

Literature Review

The growing adoption of the project-based learning has sparked meaningful discussions regarding its influence on education. While some critics express concern that project-based learning may encourage a rigid, technocratic approach, potentially limiting pupil-centered learning, research consistently shows its positive impact on pupil engagement. Studies have highlighted a strong link between project-based learning and the critical elements of meaningful learning, such as collaboration, deep subject mastery, iterative thinking, and real-world application. These features not only make

learning more relevant, but also foster a dynamic environment where pupils are actively involved in knowledge sharing and thoughtful discussion. Consequently, project-based learning has gained recognition as an effective and valuable educational approach, with widespread support for its integration into classrooms (Almulla, 2020).

Despite its potential, project-based learning is still underutilized by many educators. This study explores how project-based learning affects both pupil behavior and the professional experience of teachers, particularly regarding stress and job satisfaction. The findings suggest that project-based learning contributes positively to classroom and personal behaviors, enhancing both pupils' social skills and their academic performance. Furthermore, teachers report higher job satisfaction and a greater sense of fulfillment when using project-based learning in their teaching practices. Notably, project-based learning seems to have a particularly positive effect on pupils with emotional and behavioral disorders, helping to foster more constructive and positive behaviors. The significant benefits observed for both pupils and teachers emphasize the need for further research to understand the broader implications and potential of project-based learning in education (Taylor et al., 2024).

Project-based learning has gained significant recognition as a pedagogical approach that not only enhances pupil engagement, but also fosters critical thinking, problem-solving abilities, and collaborative skills. Maher and Yoo (2017) emphasize that project-based learning encourages self-directed learning by involving pupils in challenging, real-world tasks that promote active participation. This approach supports reflective teaching practices, allowing educators to refine their pedagogical skills while addressing global issues such as environmental sustainability.

The role of the continuing professional development in the project-based learning implementation is crucial, as highlighted by Esguerra and

Quinito (2025), who underscore the importance of strong school leadership. Effective school leadership provides teachers with essential resources, guidance, and support, which are critical for the successful execution of the project-based learning. This support system ensures that teachers can effectively manage project-based learning activities, ultimately enhancing pupil learning outcomes.

Markula and Aksela (2022) identify the key features of project-based learning, such as collaborative learning, problem-centered activities, and the integration of technology. Their study, based on the feedback from teachers and pupils in K-12 science education, reveals the challenges associated with project-based learning, including the formulation of driving questions and the establishment of the pupil-defined learning goals. These challenges underscore the need for a continuous teacher training and development. In my experience, these challenges are common in project-based learning classrooms, where teachers often struggle to balance pupil autonomy with structured guidance. Additionally, the role of technology in project-based learning is essential but sometimes overwhelming, as teachers must learn to integrate digital tools effectively into the learning process.

Imaz (2021) explores the impact of project-based learning in higher education through a longitudinal study conducted at the University of the Basque Country. The research indicates that project-based learning enhances active pupil participation, fosters real-world connections, and develops critical competencies necessary for professional growth. Similarly, Kinh et al. (2024) emphasize that project-based learning not only benefits pupils but also contributes significantly to teachers' professional development by encouraging innovative teaching methods and fostering creativity. This suggests that project-based learning is a dual-benefit model, improving both pupil learning outcomes and teacher development, as it pushes educators to adopt more creative and flexible teaching practices.

In my opinion, the success of project-based learning depends on its deliberate design to afford pupils the opportunity to express their thoughts and assume ownership of their learning experiences. While structured activities are essential for any project-based learning, the more crucial aspects of the successful project-based learning are the pupils' input in decision-making, thus encouraging a sense of agency and relevance, which calls for more intentionality on the part of the educator. Farrow, Kavanagh, and Samudra (2022) review teachers' project-based learning practices concerning their previous professional development. They point out that rewarding structured project-based learning activities that empower pupil collaboration are more likely to be implemented by teachers previously exposed to project-based learning professional development. However, they also cite a void in encouraging pupil choice and personal meaning, necessary for deeper engagement. Therefore, the authors recommend intensive, practice-based professional development initiatives to address it. I agree that structured activities support collaboration, but they must also be designed to give pupils opportunities for input and foster meaningful connections if project-based learning matters. Without these characteristics, project-based learning runs the risk of being too prescriptive and less responsive to the unique needs and interests of pupils.

Aldabbus (2018) highlights the challenges faced by primary educators in implementing project-based learning, including limited resources, time constraints, and difficulties in assessment. Despite these challenges, strategic teacher training and strong school-level support structures can facilitate successful project-based learning implementation. In my view, overcoming these challenges depends largely on how schools prioritize and allocate resources, as well as how flexible the school culture is in adopting new teaching practices. Dobson and Dobson (2021) further illustrate how project-based learning enhances pupil voice and agency through participatory action research in secondary educa-

tion, fostering a sense of community and collaboration. This resonates with my observation that when pupils are given the opportunity to take ownership of their learning, they become more invested and motivated to engage with the material.

Bramwell-Lalor et al. (2020) provides a strong argument for incorporating project-based learning in the curricula to enhance environmental competencies and sustainability education. Their study suggests that project-based learning can serve as an effective way to address global challenges by fostering collaboration and action-oriented learning. In my view, project-based learning has potential in environmental education, as it can empower pupils to take concrete actions toward sustainability, thus making the learning experience more meaningful. Zhang and Ma (2023) provide a comprehensive meta-analysis of project-based learning studies, showing significant improvements in academic achievement, critical thinking, and affective attitudes across different regions and subject areas. However, I argue that, while the academic benefits of project-based learning are evident, there is still a need for more research into how project-based learning can be adapted to suit different cultural contexts and pupil needs.

In my opinion, arts integration in project-based learning is often ignored, yet it is undeniably an important aspect that greatly enhances creativity and interdisciplinary thinking. The arts and the aesthetic dimension add excitement to projects while promoting critical thinking and innovative expression among pupils. With the presence of arts, pupils can connect concepts across disciplines, thereby providing a more comprehensive schooling experience. In a study by Hawari and Noor (2020), the authors extensively discuss the contribution of the project-based learning to science, technology, engineering, arts, and mathematics education (STEAM), which accentuates the role of arts and aesthetics in developing communication, leadership, and creativity among pupils. The discussion further highlights

how project-based learning in STEAM education provides settings and situations for pupil collaboration in developing certain cornerstone skills of the 21st century. Likewise, the researchers named other related dynamics and challenges teachers face when selecting appropriate projects and assessing the ones that capture the breadth and depth of learning in STEAM. This resonates with my conviction that while project-based learning can be successfully utilized for stimulating creativity, its use requires profound thought and planning, especially when involving the arts and assessing pupil progress across such diverse disciplines.

Gültekin (2005) and Tempera and Tino-ca (2022) stress the importance of aligning teacher training programs with practical, learner-centered methodologies to support novice teachers in implementing project-based learning. My view is that the teacher training programs should put a strong emphasis on theory as well as practical, hands-on experiences of teachers working directly with project-based learning. Such emphasis could help join theory with practice to enable teachers to practice project-based learning effectively. They will experience it firsthand.

In their 2021 article, Miller, Severance, and Krajcik stress the importance of adopting adaptive and responsive teaching practices in project-based learning, especially for science education. They insisted on sustained pedagogical changes that could guarantee a rigorous and effective learning experience. This view holds that project-based learning will not be a one-off occurrence in a teacher's practice, but rather an ongoing process that keeps the teacher flexible and responsive to pupils' needs, learning progress, and the complexities of the projects. I would like to emphasize the strength of the project-based learning to make the teacher change methods in the real-time in this regard, creating an environment in which learning experiences can be tailored to the dynamic, ever-evolving needs of the pupils. Adaptability in this way would allow a sci-

ence project to give abstract ideas a concrete meaning and relevance.

Molina Torres (2022) emphasizes that the active learning model will have to undergo substantial methodological changes, especially in the preparation of future teachers. Torres argues that there needs to be a clear shift from conventional teaching toward more interactive, pupil-enabled methods that involve future educators in meaningful learning processes. This understanding is critical because, unless teachers cultivate the skills and attitudes supportive of active learning, the full potential of project-based learning will not be achieved. I contend that this new style of teaching is not only about the delivery of content, but about the reconceptualization of teaching as a whole. Future educators must be ready and willing to embrace pupil-centered teaching practices that cultivate critical thinking, collaboration, and inquiry learning—all paramount to project-based learning.

According to Muhria, Syarifudin, and Wiarsih (2021), classroom action research shows project-based learning as promising in boosting English learning. The study proves that project-based learning could be effectively applied in language education, where it engages pupils in actual communication tasks and real-world language usage that improves their language use. It not only improves the English proficiency of the pupils, but also encourages them to cooperate, solve problems, and utilize languages in practical contexts. Thus, language learning through project-based learning is a powerful avenue to integrating and anchoring language into reality and personalized learning for the pupils. This is enhanced by action research as it allows teachers to reflect on and improve personal project-based learning practices according to the pupils' outcomes so that the approach itself can be improved continuously to fit pupils' needs.

Overall, literature underscores that project-based learning enhances both pupil learning and teacher professional development. Effective project-

based learning implementation requires continuous institutional support, comprehensive continuing professional development programs, and adequate resource allocation. Regular workshops, peer mentoring, and collaborative learning communities are essential for refining teaching strategies and fostering lifelong learning among educators. Continuous investment in continuing professional development is vital for promoting innovation and excellence in primary education through project-based learning. Moreover, school leadership is central to the creation of a supportive environment by providing teachers with adequate resources, time, and freedom to experiment with new methods when adopting project-based learning. Above all, we expect teachers to exercise reflexivity by evaluating the impact of project-based learning on pupils, enabling them to adjust their approaches accordingly. Meanwhile, for project-based learning to gain more popularity, educators must continue to conduct action research and collaborate to refine it. Eventually, continuous professional development and institutional support will make this practice permanent and sustainable for use in education.

Methodology

In this study, a qualitative research design was used to look into how project-based learning is used and what effects it has on primary school social science classrooms. Specifically, the study looked at how teachers' ongoing professional development improved the way they taught. A plethora of data collection tools, such as semi-structured interviews, classroom observations, and pupil reflections, were incorporated in this study, which was set in a well-known primary school in Dhaka that was recognized for its innovative teaching methods. The primary participants in this study included teachers in primary schools, primary school pupils, and school administrators, who were quite invaluable in giving insight into the effectiveness of both the project-based learning and continuing professional

development initiatives. The analysis of the findings was done thematically so that key ideas and issues related to teaching practices, pupils' role in learning, and the influence of professional development could be thoroughly explored. The findings reveal that project-based learning integration, along with directed continuing professional development actions, contributes to more active and collaborative learning environments. Whereas teachers felt more confident concerning their teaching styles, pupils showed a capacity to improve their skills in problem-solving and critical thinking. The final account highlighted the importance of the continuous professional development in sustaining rich pedagogical innovations.

Participants

The study involved the following participants:

- Four social science teachers
- Sixteen teachers of other subjects
- One head teacher

We selected the teachers based on their experience with project-based learning in social science education. Pupils were chosen to represent a diverse range of learning abilities and backgrounds. Data from teachers and pupils were gathered to understand the practical application of project-based learning and its effects on pupil engagement and learning outcomes. Additionally, the perspectives of the school administrators provided an insight into the institutional support for continuing professional development and the integration of project-based learning within the school's broader educational framework.

Data Collection Methods

The data collection process involved three main methods:

1. **Semi-Structured Interviews:** The semi-structured interview method was used to engage the teachers in discussions relat-

ing to their teaching methods, the barriers they faced while implementing project-based learning, and their views on the influence of project-based learning on pupils' learning. This method allowed for some flexibility in that it provided teachers with the freedom to share some of their experiences while addressing specific questions put forth in the study. The semi-structured format ensured an exhaustive treatment of some salient matters, such as the role of continuing professional development in improving teaching practices. There was a semi-structured interview with the head teacher, focusing on the wider education environment of the school, the role of leadership in the implementation of project-based learning, and how continuing professional development initiatives mesh with it in order to support the teaching staff. This semi-structured interview approach allowed the head teacher to explore these areas in depth while maintaining the flexibility to explore other topics that arose during the interview.

2. Classroom Observations: We conducted observations in the classroom to assess pupil engagement and understanding, particularly on environmental matters discussed within the project-based learning framework. The observations sought to capture project-based learning integration in lessons, pupil interactions with the subject matter, and demonstrations of understanding of the issues presented. Another focus of the classroom observations was the teacher's role in facilitating pupil-driven learning and providing collaborative activities within the project-based learning framework. Much attention was paid to how pupils interacted with peers and applied their critical thinking skills

to real-world problems. The observers recorded pupil autonomy in the learning process and resources used during the lesson. These observations further informed us about the strengths and challenges of project-based learning implementation in social studies classroom practice.

3. Pupil Reflections: Pupils were asked to provide written or verbal reflections on their learning experiences, focusing on their personal understanding of the environmental topics discussed and how the project-based learning approach influenced their learning. These reflections offered valuable insight into the pupils' perspectives on the effectiveness of project-based learning and their own educational development. The pupil reflections also highlighted the skills they felt they had developed, such as teamwork, communication, and problem-solving, through their involvement in project-based learning activities. Many pupils expressed increased motivation and a deeper connection to the subject matter as a result of the hands-on, inquiry-based approach. Some pupils noted the challenges they faced but appreciated the opportunity to explore real-world issues in a more interactive way. These reflections provided a pupil-centered perspective on the overall impact of project-based learning on both academic and personal growth.

Data Analysis

The semi-structured interviews collected data from classroom observations and pupil reflections for thematic analysis. This revealed the major themes on the application of project-based learning, effectiveness of the teaching strategies, pupils' engagement, and the role that continuing professional development plays in facilitating better practices of teaching. The analysis was looking into how,

through continuous opportunities for professional development, the teachers can reshape their teaching practices to enable them to do project-based learning more successfully, thus also feeding into improved learner outcomes in primary social science classrooms. Thematic analysis also reveals a link between specific continuing professional development activities, like workshops and peer collaboration, and teachers' heightened confidence in utilizing project-based learning. According to what the teachers had reported, continuing professional development not only provides new teaching strategies, but also a deeper understanding of pupil-centered learning methods. The data also indicate that when teachers felt they had support through continuing professional development, they were more apt to engage pupils in authentic tasks that were meaningful. In short, the entire analysis showed that continuing professional development was critical in linking classroom theory and practice.

Ethical Considerations

Ethical guidelines were rigorously followed throughout the research process. Informed consent was obtained from all participants, ensuring they were fully aware of the research goals and their voluntary involvement. Confidentiality was maintained throughout the data collection and analysis process, with all identifying information was anonymous to protect participants' privacy.

This study also underscores the importance of continuing professional development in equipping teachers with the necessary skills and knowledge to effectively implement project-based learning, contributing to improved teaching practices and better learning outcomes for pupils.

The Findings

This part of the research report outlines the main conclusions drawn from the findings, followed by discussion of their implications for the imple-

mentation of project-based learning in classrooms for primary social sciences. The enriching insights gained from the study reveal the impact of project-based learning on professional teacher development and pupil involvement while also identifying the limitations experienced in implementing such methodologies. We then extend the discourse about these findings, contextualize them, and suggest ways to enhance successful project-based learning practices in the classroom.

1. Teachers' lifelong learning and professional development

The findings indicate that project-based learning has a role to play in the development of a culture of lifelong learning among teachers. Teachers adjust their teaching through collaborative lesson planning, identifying and solving problems, and new innovative teaching methods. It is this cycle of planning, implementation, and reflection that helps teachers continually change their ways of teaching and improve their effectiveness. They said project-based learning had allowed them to

- Promote learning in a reflective manner.
- Implement peer learning with collegial support.
- Increase their abilities for adaptability and creativity in lesson design.

2. Pupil engagement and environmental awareness

The findings of the classroom observation showed that through project-based learning activities, pupils experienced a greater intensity of understanding about environmental issues, particularly pollution. Some of the collaborative activities involving poster production, organizing environmental campaigns, and proposing public actions truly engaged pupils in sharpening their critical thinking and collaboration skills. Pupils demonstrated the following outcomes:

- Increased awareness concerning environmental issues.
- Improved problem-solving ability.
- More enthusiasm for learning through practical experience.

3. Overcoming challenges in project-based learning implementation

Although project-based learning has proven to be effective, teachers encounter a lot of problems in its implementation: limited resources, time constraints, and insufficient institutional support. However, they found that gradual adoption, integration into the curriculum, and extended continuing professional development programs mitigated such hurdles. The key elements identified by teachers that would help in overcoming implementation barriers include:

- Collaborative planning and sharing best practices among peers.
- Support from parents for project-based activities outside the classroom.
- Clear guidelines and flexible assessment strategies.
- Use digital tools to better manage projects and facilitate pupil collaboration.

Discussion

The results indicate positive outcomes for the teacher's professional development through project-based learning and further discussion about the continuing professional development needed to sustain this growth. Teacher development can place continuing professional development in the structure of programs that promote the integration of the project-based learning methodologies. Supporting the establishment of collaborative networks and peer mentoring will contribute to making project-based learning sustainable over the long term. There is further qualification on the part of the

teacher in developing meaningful learning experiences through project-based learning with ongoing resources and opportunities to share best practices.

Additionally, the integration of the project-based learning into professional development frameworks should emphasize continuous learning and adaptation, allowing teachers to refine their skills over time. Ongoing continuing professional development opportunities will also enable educators to stay current with the evolving demands of the project-based learning and foster a community of practice where teachers can exchange ideas and strategies. By prioritizing these elements, schools can create a supportive environment that encourages teachers to innovate and improve their teaching methods. This commitment to professional growth will ultimately enhance the effectiveness of the project-based learning and contribute to better pupil outcomes.

The findings indicate that the project-based learning method greatly engages pupils, especially when real-world issues, such as environmental problems, are incorporated into the content. This indicates further potential for project-based learning to not only enhance academic concepts and achievements, but also strengthen pupils' socio-environmental responsibility. The emphasis on collaboration and problem-solving places pupils toward a broader project-based learning objective of equipping pupils with competencies considered vital for the 21st century, including critical thinking, teamwork, and problem-solving. Therefore, we should integrate project-based learning concepts with real-world problems to enhance pupil motivation and improve their learning outcomes.

Despite this, the challenges that awaited project-based learning are nothing new. Sound planning and adequate support could remediate these obstacles. Most important of all, however, is establishing a culture of collaboration among teachers, parents, and a wider school community for success in the venture. The importance of digital tools and

clear guidelines cannot be overemphasized; they will facilitate the smooth operation of projects in communication. By promoting a clear and flexible approach to assessment, teachers will be encouraged to engage more competently with project-based learning and thus enable pupils to demonstrate their learning outcomes. Addressing the challenges mentioned above will thus help achieve a better process of implementing project-based learning and ensure future success.

The findings from this study highlight the significant potential of project-based learning in enhancing both teacher professional development and pupil engagement. By addressing the challenges of resource limitations and implementing strategies such as collaborative planning, parental involvement, and the use of digital tools, project-based learning can be successfully integrated into primary education. Schools and educators must continue to support project-based learning through ongoing professional development, reflective practices, and a culture of collaboration, ensuring its continued effectiveness in fostering meaningful learning experiences for both teachers and pupils.

Recommendations

We propose the following recommendations to enhance the implementation of the project-based learning and support teachers' continuing professional development. These strategies aim to improve teaching practices, foster a culture of lifelong learning, and ensure that project-based learning becomes an integral part of the educational experience for both pupils and teachers.

1. Institutionalizing continuing professional development for project-based learning

Schools should have structured and ongoing professional development programs on project-based learning methodologies emphasizing teachers' lifelong learning. Continuing professional de-

velopment should encompass periodic workshops, peer mentoring, and research-based practices to develop teachers' skills for effective project-based learning delivery.

2. Creating a culture of lifelong learning:

Schools should encourage teachers to embrace ongoing learning through collaborative networks, professional learning communities, and cross-school partnerships to share innovative project-based learning strategies.

3. Embedding project-based learning in the curriculum through continuing professional development:

A systematic continuing professional development approach needs to be developed in order to embed project-based learning as a central pedagogy in social science and environmental education. Teachers should be trained to design effective project-based learning projects and assess pupil outcomes in an appropriately meaningful way.

4. Resource allocation for sustainable professional development:

Schools and relevant policymakers should ensure that adequate resources are allocated to continuing professional development programs that promote project-based learning implementation. Priority should be given to procuring educational materials and digital tools and organizing training sessions with experts in their respective fields.

5. Encouraging reflective practice for professional growth:

Continuing professional development programs should include reflective teaching practices that call on teachers to regularly evaluate their teaching methods. Teachers use reflective practice to identify areas for growth and improve their ability to respond to changing classroom situations.

6. *Long-term policy support for continuing professional development in project-based learning:*

Education authorities should establish long-term policies to support continuing professional development for project-based learning, ensuring that teachers at all levels continue to have access to professional development opportunities.

Recommendations aim to address the critical components needed to effectively implement and sustain project-based learning in classrooms. By institutionalizing continuing professional development programs, fostering a culture of collaboration, ensuring resource allocation, and promoting reflective practices, schools can support teachers in their ongoing professional growth and enhance the learning experience for pupils. With long-term policy support, project-based learning can be successfully embedded into curricula, making learning more engaging, meaningful, and relevant for pupils. The implementation of these strategies will not only improve teaching practices, but also prepare pupils with the 21st-century skills they need to succeed in an increasingly complex world.

Conclusion

The present study highlights that project-based learning can transform environmental awareness and

lifelong learning in pupils and teachers. While economic and temporal barriers exist, structured continuing professional development should accommodate project-based learning and pedagogical innovation. Findings suggest that project-based learning works in a reinforcing cycle, whereby teacher development benefits pupil learning, and active learning by pupils inspires further innovations in the practice of teaching. Future research needs to examine larger institutional policies to scale project-based learning implementation at the primary level in a variety of contexts. Continuing professional development remains important for developing skills and confidence among teachers for effective project-based learning implementation. Continuing professional development also provides opportunities for teachers to share experiences, reflect on challenges, and discuss innovative strategies. In others, project-based learning focused training embedded in continuing professional development programs would facilitate sustained pedagogical growth and adaptability. The future research agenda should investigate how modified continuing professional development initiatives affect both teacher readiness for project-based learning and pupil engagement in project-based learning. Finally, improving continuing professional development frameworks will generate a basically viable and dynamic teaching community that can bring forth significant transformation in education through project-based learning.

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Кондокар Сабера Хамид

Саути поинти школа и факултети, Дака, Баніладеш

ЕКОЛОШКА СВЕСТ КРОЗ ПРОЈЕКТНО УЧЕЊЕ У НАСТАВИ ПРИРОДЕ И ДРУШТВА У ОСНОВНИМ ШКОЛАМА У ДАКИ: КВАЛИТАТИВНА АНАЛИЗА

У раду истражујемо како учење засновано на пројектима промовише доживотно учење међу наставницима и еколошку свест међу ученицима у једној школи у Даки. Пројектно учење се истражује у односу на свест ученика о зајатењу ваздуха, воде, земљишта и звука. Подстичући рефлексивне праксе и педагошки развој, пројектно учење помаже наставницима да се професионално развијају. Кроз развој наставника и ангажовање ученика на стварним питањима истраживање показује да пројектно може да створи ангажовање и прилагодљиве окружење за учење. У раду се анализира како пројектно учење може да помоћу наставницима да оствари интроспективнији и иновативнији кроз континуирани професионални развој, чиме се побољшавају исходи ученика. Релевантност налаза истраживања је двострука. Прво, анализиран је утицај пројектног учења на наставнике и како оно подржава доживотно учење кроз рефлексивну праксу, сарадњу и модификацију наставних техника. Друго, истражено је како пројектно учење може да побољша еколошку свест ученика у основној школи. Подстичући ученике да се баве проблемима из стварног света, као што је зајатење, пројектно учење не само да подстиче критичко размишљање и вештине решавања проблема већ и подстиче осећај друштвене одговорности. Истраживање је спроведено у једној уредној основној школи у Даки, познатој по својим иновативним приступима подучавању. Било је корисно тестирајући пројектно учење у наставном плану и програму еколошког образовања и стручној усавршавања наставника у овој школи. Полуструктурирани интервјуи са наставницима, опсервација часова у учионици и размишљања ученика били су извор податка за истраживање. Интервјуисали смо четири наставника Природе и друштва, шеснаест других предметних наставника и директор школе о пројектном учењу, проблемима у вези са оваквим учењем и утицају на учење ученика. Посматрали смо еколошку ангажованост ученика на часу. Размишљања ученика открила су податке о њиховом личном развоју, еколошкој свести и вештинама решавања проблема. У квалитативном истраживању коришћена је тематска анализа податка из интервјуа, као и зајажња и размишљања ученика. Истраживање је открило различите резултате у вези са пројектним учењем и континуираним професионалним развојем. Истраживање је показало да је пројектно учење помоћу наставницима да се професионално развијају повећањем рефлексивних пракси и тимског рада. Континуирано планирање, имплементација и коментарисање часова помоћу су наставницима да се побољшају, а они су се осећали сигурније када су користили тактике пројектног учења. Уводећи нове наставне методе и стижући увид у учење ученика, континуирани програми професионалног развоја помоћу су наставницима да унапреде свој рад. Истраживање је показало да је пројектно учење повећало еколошко знање и учење ученика. Питања животног средине, посебно зајатења, била су боље схваћена, а ученици су били више ангажовани у практичним активностима. Сарадња и тимски рад помоћу су ученицима да науче вештине 21. века, као што

су комуникација, решавање проблема и критичко размишљање. Многи ученици су показали повећану мотивацију и ангажовање у вези са овим истраживањем, што указује на све већи осећај одговорности за животној средину. Резултати истраживања показују да пројектно учење може помоћи ученицима да се развију академски и друштвено. Истраживањем такође открили различите препреке за имплементацију пројектног учења. Ресурси, време и институционална подршка били су проблеми за наставнике. Наставници су подстицали сарадничко планирање, учешће родитеља и дијигалне алате за управљање пројектима, као и сарадњу међу ученицима у решавању ових проблема. Ове стратегије и континуирани професионални развој били су приоритети како би пројектно учење постало одрживије и делотворније. Истраживање има различите педагошке импликације за школе које примењују пројектно учење. Предлаже се институционализација програма континуираног стручног усавршавања заснованог на пројектима који су фокусирани на учење у школама. Ови програми треба да понуде наставницима обуку, менторство и праксе засноване на истраживањима. Друго, заједнице за стручно усавршавање и међушколска партнерства треба да промовишу дужиновно учење у школама. У раду се такође сућерише да пројектно учење треба да буде саставни део наставног плана и програма како би наставници знали како да направе добре пројекте и да вреднују најредак својих ученика на смислен начин. Школе такође треба да обезбеде довољно наставног материјала и дијигалних алата за пројектно учење. Коначно, програми континуираног стручног усавршавања треба да укључе рефлективне наставне праксе како би наставницима омогућили да често евалуирају своје часове и пронађу области у којима могу да се развијају. Истраживање је показало да пројектно учење побољшава еколошку свест и целоживотно учење ученика и наставника. Структурирано и континуирано стручно усавршавање може да помогне да пројектно учење буде успешно упркос ограниченим ресурсима, унапређујући наставу и исходе ученика. Будућа истраживања би требало да истражују како модификоване иницијативе за континуирано стручно усавршавање утичу на spremност наставника за пројектно учење и како ученици учествују у интеракцију са овом методом.

Кључне речи: пројектно учење, еколошка свест, основно образовање, целоживотно учење, стручно усавршавање наставника