



Project-Based Learning as a pedagogy for 21st CC education with reference to NEP 2020 – A study of the middle stage grade of Government Schools in Kandhamal, Odisha

Author-1- Dr. Saktikanta Barik, Program Manager, Piramal Foundation

Co-author- Vandana Sharma, Program Director, Piramal Foundation

Co-author- Biswarupa Sutar, Program Leader, Piramal Foundation

Abstract

This study examines the implementation and outcomes of Project-Based Learning (PBL) as a classroom pedagogy in government middle schools of Kandhamal district, Odisha a predominantly tribal, economically marginalized region facing persistent learning deficits despite infrastructure improvements. Aligned with India's National Education Policy 2020, the research explores how experiential, student-centered pedagogy can be operationalized in resource-constrained contexts marked by linguistic diversity and socio-cultural complexities. The study employed qualitative methods including classroom observations, semi-structured teacher interviews, and content analysis of curriculum materials to document PBL integration across Grades 6 to 8. Projects were deliberately contextualized within students' lived realities, need of the classroom processes validating indigenous knowledge while cultivating 21st-century competencies. Findings reveal transformative shifts: teachers transitioned from knowledge transmitters to reflective facilitators through practice-embedded professional development; first-generation learners, particularly from tribal communities, demonstrated heightened agency, collaboration, and problem-solving capabilities when education honored their cultural contexts; and community-grounded projects yielded tangible outcomes beyond abstract academic achievement. However, sustainability challenges persist, including examination pressures, teacher training gaps, administrative burdens, and socio-economic constraints that pull students from sustained engagement. The study contributes empirical evidence for scaling experiential pedagogies in India's public education systems, particularly in aspirational and tribal districts, arguing that PBL effectiveness depends on local rootedness, systemic policy reforms, and sustained support infrastructure that strengthens rather than bypasses government structures.

Keywords: Project-Based Learning; middle school pedagogy; experiential learning; National Education Policy 2020; Kandhamal Odisha

Introduction:

With 15 lakh (1.5 million) schools, over 10.1 million (1 crore) teachers, and more than 24 crore (240 million) students as of the 2024–25 academic year, the Indian school education system remains one of the largest school education system in the world. Notable progress has been made in both access and infrastructure: nearly half the students are enrolled in government schools, around 41% in private schools, with the remainder in government-aided institutions. Female representation among school teachers has risen beyond 54%, and girls' enrolment now stands at 48.3%.

In 2024–25, India's school education system recorded significant progress, with the pupil-teacher ratio improving to 10:1 at foundational, 13:1 at preparatory, 17:1 at middle, and 21:1 at secondary levels. The

teacher workforce grew by 6.7% since 2022–23, surpassing one crore for the first time. Gross enrollment in secondary education reached 78.11%, reflecting steady annual gains. Infrastructure development also advanced notably, with widespread availability of digital resources, electricity, internet access, hand-wash stations, girls' toilets, and well-equipped libraries, according to UDISE+ 2024–25.

Despite these achievements, significant learning deficits persist. The Annual Status of Education Report (ASER) 2024 indicates that only 45.8% of students in Grade 8 could solve basic arithmetic problems, and foundational numeracy and reading skills remain a concern at early grades. Similar to previous years, millions of children lag behind their grade-level curriculum, and many reach young adulthood without acquiring the essential literacy and numeracy skills necessary for satisfying employment.

The existing textbook-driven, teacher-centered, and traditional teaching-learning practices have proven inadequate in equipping students with the essential skills required for the 21st century. Therefore, it is imperative to nurture these competencies among the younger generation. Failure to do so may leave them unprepared and struggling to thrive in an increasingly globalized world. According to Pearlman (2006), "Societies need citizens who are smarter, more creative, and more capable of leading, managing, collaborating, and networking with productive people around the world." A multi-dimensional workforce can be developed only by providing abundant learning opportunities in real-life contexts and engaging students in diverse projects that encourage collaboration based on their needs and interests. In this context, Project-Based Learning (PBL) emerges as an effective and authentic strategy to cultivate and enhance 21st-century skills among learners.

The contemporary education landscape demands a transition from conventional, teacher-centered methodologies to learner-centered pedagogies that cultivate critical thinking, creativity, and practical problem-solving. The *National Education Policy (NEP) 2020* advocates replacing rote-based systems with **experiential learning** a pedagogy rooted in *learning by doing*, active participation, and real-world engagement. Experiential learning nurtures holistic development by blending cognitive, social, and emotional growth while preparing learners for lifelong adaptability

The NEP proposed a paradigm shift towards an experiential and skill-based learning approach for Indian schools that moves beyond rote learning to foster creativity, collaboration, and critical thinking. This requires embedding activity-based, project-driven, and inquiry-oriented experiences across all subjects, equipping teachers through ongoing professional development in experiential pedagogy, and reforming assessment systems toward continuous and competency-based evaluation.

Project Based Learning

In the 21st century, rapid technological progress and evolving workforce needs demand education that equips students with real-world skills, adaptability, and a lifelong learning mindset essential for future careers and personal growth.

PBL is a student-centric teaching and learning process to enable students to solve real-world problems (Thomas, 2000). Throughout the processes, collaborative projects allow students to learn new content and develop new sets of skills via active learning, critical thinking, and collaboration among students (Boss & Larmer, 2018). Integrating Project-Based Learning (PBL) into the curriculum enables teachers to build an engaging, dynamic, and meaningful learning environment that equips students with the skills and mindset needed to thrive in the 21st century.

PBLWorks promotes a research-informed model for "Gold Standard PBL." The Gold Standard PBL model encompasses two useful guides for educators:

- **Seven Essential Project Design Elements** provide a framework for developing high quality projects for the classroom
- **Seven Project Based Teaching Practices** help teachers, schools, and organizations improve, calibrate, and assess their practice.

Project-based learning is implemented in the school processes mainly through four phases. Initially, students are encouraged to identify problems through observation, asking questions, seeking information, and applying their prior knowledge. By actively constructing their understanding, learners develop a deeper and more meaningful understanding of the problem (Chrestensen, 2007; Bruno et al., 2019).

Students deep dive into the identified problem, critical analysis and detailed brainstorming of potential solutions. They try to explore potential collaborations for designing the solution and define the role of each team member. By working collaboratively, learners can share ideas, build on each other's strengths, and develop a more sophisticated understanding of the problem (Xiaodan et al., 2019; Jayashree et al., 2021).

Further from here, children allocate responsibilities and work collaboratively to implement the solution and build a public product. Internal and external collaboration and communication. Implementing plans and prompting team members to perform their tasks.

In the concluding phase, students are presented with tasks or problems that relate to their lives and interests, and that require them to apply the concepts and skills they are learning in authentic and meaningful ways. They review and plan for long-term sustainability and utility aspects of their public product and transfer the ownership to relevant stakeholders. Students develop the skills and knowledge for success in solving real-world problems (Alshare & Nitham, 2004; Mahmoud & Idris, 2021).

Project-based learning is more focused on students' activities; they are involved in planning, designing, and implementing the project in real-life situation in collaboration with co-learners and the teacher who provides scaffolding in their learning. By integrating PBL in classroom processes, students are provided with opportunities to engage in meaningful and authentic tasks that encourage the 21st century skill, i.e., active learning, critical thinking, and collaboration.

This study seeks to apply project-based learning as a transformative pedagogy in the middle stage of education in government schools of Kandhamal district of Odisha, for the development of 21st-century abilities.

Objective of the study:

- To explore how the experiential learning approach is being implemented in Indian upper primary schools in the context of NEP 2020
- To analyse the significance of Project-Based Learning as a pedagogy being used in Upper Primary schools as best practices in Kandhamal district, Odisha

Research Method:

Researchers have observed the classroom practices by visiting the upper primary school of Kandhamal district. Semi-structured interviews with teachers helped the researcher to obtain very meaningful and relevant information regarding the projects and practices. Apart from this, the researchers employ the content analysis method available in secondary sources i.e. policy documents, government reports, and contextualized curriculum designs, etc.

Project-Based Learning in India

The National Education Policy (NEP) 2020 emphasizes a paradigm shift in India's primary education by promoting experiential and life-related learning. Recognizing primary education as a crucial stage for cognitive, social, and emotional development, education authorities, school leaders, and NGOs working alongside the government are developing programs that inspire teachers and students to engage actively in learning through real-world applications of knowledge.

Project-Based Learning as Pedagogy in Kandhamal

Project-based Learning in the Government school of Kandhamal district aims to develop 21st-century skills among students and teachers of Grades 6-8. Students learn by exploring authentic, real-life problems, devising effective and sustainable solutions, and deploying these solutions in their school or community contexts. This pedagogical approach requires learners to apply scientific thinking, mathematical literacy, compassionate and critical thinking, creative communication, and creativity to devise effective and sustainable solutions to authentic problems identified in students' immediate contexts. Project-based classrooms, thus, serve as interfaces for students to utilize and develop academic and 21st-century skills.

Students are now encouraged to:

- Explore, identify, and understand real-world problems and community needs in their immediate context.

- By using their subject knowledge & existing understanding, visiting natural places, which helps them in developing innovative solutions and a scientific temperament by solving community problems
- Divide into groups and take part in role-playing activities such as dramas, mock debates, drawing and art competitions, and elocution contests to bring lessons to life
- Use exhibitions and the art of storytelling they express and communicate concepts, showcase their project-based learning approach, and make learning more participative and interesting.

All these learning approaches perfectly align with the Gold Standard PBL framework i.e. **Challenging Problem or Question, Sustained Inquiry, Authenticity, Student Voice & Choice, Reflection, Critique & Revision, and Public Product** and the 4 C approach i.e, Collect, Create, Change, and communicate.

For example, a project on a zero plastic waste school might include:

- Understand that the pollution caused by the daily use of plastic is deteriorating schools and the community. Realized and are thinking about how to effectively manage and reuse the plastic waste generated from the school. Discuss the different types of plastic waste and can be recycled.
- Students will understand the root cause of the problem, discuss it with the teacher, community members, experts, and discuss the possible solution to reduce plastic waste at the school and community levels. Students will discuss 4R- Reduce, Reuse, Recycle & Refuse, and what can be done around them.
- Invite an expert to the school to support the creation of bricks and a Hanging Garden from waste plastic. Divide students into two groups to make Hanging gardens and eco-bricks. Experts and teachers will assess both the groups' tasks done and appreciate them, and give feedback. The teacher will discuss how this prototype will be created. Students reflect on how eco-bricks and hanging gardens solve plastic waste problems in their village as well as at school.
- Students prepare a skit/story/assembly role play - to showcase the problem, the importance of solving it, the solution done by students, and how can school/community can help them reduce the problem. Students will create an exhibition and showcase all the upcycled products/showpieces from eco-bricks in the school. Students will reflect and write their thoughts and learnings, and share.

At Kandhamal School, the teacher employs formative assessment methods to monitor student progress through rubrics, continuous observation, self-reflection, and portfolio-based evaluations of both process and product. This student-centered and hassle-free approach ensures meaningful learning experiences for all learners. It has elevated the Project-Based Learning (PBL) model, positioning it as an inspiring framework for future educational reforms across Odisha and India also.

Challenges in Project-based Learning in Kandhamal:

The impact of Project-Based Learning has been observed only in intervention schools, still the Project-Based Learning is underutilized in plenty of government and rural school, where the traditional teaching method continue to dominate. Project-based learning (PBL) in Kandhamal faces several serious challenges, mainly due to local socio-economic conditions, exam-oriented educational system, educational gaps, insufficient teacher training in PBL, and resource constraints. These challenges affect both the planning of projects and the day-to-day classroom implementation in the district's schools.

Socio-economic and cultural challenges

Kandhamal is a predominantly tribal, economically backward district where many families depend on agriculture, daily wage work, and forest produce, which often pulls children away from regular schooling and sustained project work.

Deep-rooted cultural practices and local languages can also create a gap between textbook-based projects and students' lived realities if projects are not carefully localized. When PBL tasks ignore tribal knowledge, traditional livelihoods, or local idioms, students may see projects as irrelevant or intimidating rather than empowering

Exam-Oriented Educational System:

India's education system has traditionally revolved around high-stakes board examinations, which encourage rote memorization instead of deep conceptual learning. As a result, many schools give precedence to exam coaching rather than experiential, student-centered approaches to teaching. In Kandhamal, this pattern is

reinforced because a large proportion of teachers have had limited training or exposure to experiential and project-based pedagogies, making it difficult to move beyond exam-oriented classroom practices.

Insufficient teacher Training:

Teacher training challenges in Kandhamal directly affect how far interactive, hands-on learning can actually happen in classrooms. Even though there are formal teacher education institutes in the district, most in-service support still does not fully equip teachers to use experiential methods with tribal and multi-grade classes. Pre-service and in-service training in Odisha has historically focused more on syllabus coverage, lesson plans, and textbook handling than on project-based or activity-based pedagogy.

Access and continuity of professional development:

While institutions like the Government Teacher's Training College and DIET/ETEI at Phulbani exist to serve Kandhamal, fail to provide training support on innovative teaching and learning practices. Follow-up support through school visits, mentoring, or peer learning communities is often weak in remote tribal pockets, so whatever is learnt in workshops is rarely reinforced through classroom coaching.

Administrative burden and non-teaching work

Like government schoolteachers across India, teachers in Kandhamal spend a significant portion of their time on non-teaching duties such as data reporting, record-keeping, UDISE entries, scholarship and account work, and monitoring midday meals. These tasks reduce preparation time for lessons and leave little energy for planning creative projects, making teaching more clerical and less reflective.

Impact on experiential and project-based learning

Because many teachers are not deeply trained in activity-based and project-based strategies, they may see such methods as "extra work" rather than core pedagogy, especially under exam pressure. In Kandhamal's tribal and multi-lingual classrooms, the absence of strong training in using local culture, language, and environment as learning resources further weakens the quality of projects and hands-on tasks

Reflective Observation of Teachers

Smt. Priyanka Nayak: Water Conservation Project

Priyanka Nayak had taught environmental science for eight years, always following the textbook chapter on water resources dutifully definitions of groundwater, diagrams of the water cycle, questions and answers memorized for exams. When she facilitated the water conservation project, she asked her Grade 7 students to identify water-related problems in their village. The silence that followed unsettled her. She had expected immediate answers, clear problems she could guide them toward solving. Instead, students looked uncertain, as if permission to observe and name issues in their own lives was unfamiliar territory. After days of hesitant starts, one girl mentioned that women in her hamlet walked two kilometers each morning to fetch water from a stream because the hand pump had been dry for months. Suddenly, the classroom became animated other students shared similar stories, drew maps of water sources, debated why some wells dried faster than others.

What shifted fundamentally for Priyanka was her understanding of what constituted teaching. She had always measured success by syllabus completion, by students' ability to reproduce textbook content. Now she watched them interview their grandmothers about vanished ponds, calculate daily per-capita water consumption across households, design rainwater harvesting models using local materials, and present findings to the gram panchayat. The questions they asked—about soil permeability, seasonal water tables, government schemes that existed on paper but not in practice—went beyond her own knowledge. Instead of feeling diminished, she found herself saying, "Let us investigate this together," a phrase that initially felt like admitting inadequacy but gradually became an expression of intellectual partnership. When the project concluded with students successfully advocating for the repair of a community well, Priyanka realized she had facilitated learning far deeper than any chapter completion could achieve, though the persistent worry about examination readiness never entirely disappeared.

Shri Ranjan Pradhan: Anemia Project

Ranjan Pradhan taught mathematics and had always believed his subject had little connection to students' daily lives beyond shopkeeping arithmetic. When the school decided to implement a project on anemia—a severe

health concern in Kandhamal's tribal communities—he was initially baffled about his role. Science teachers would handle biology, language teachers would manage documentation, but what could mathematics contribute? The breakthrough came when students designing an awareness campaign needed to understand the magnitude of the problem. They surveyed 150 households across three hamlets, collecting data on dietary patterns, hemoglobin levels from health camps, and frequency of iron-rich food consumption. Suddenly, his classroom became a space for data analysis—calculating percentages of affected families, creating bar graphs comparing anemia prevalence across age groups, computing the cost-benefit of iron supplementation versus dietary interventions.

What struck Ranjan most was observing students who had struggled with abstract mathematical problems engage intensely with the same concepts when embedded in authentic contexts. A boy who could never remember formulas accurately calculated the proportion of adolescent girls suffering from anemia and argued passionately about why this was alarming. A girl who found fractions confusing worked meticulously to determine what fraction of weekly meals in her village included green leafy vegetables. Ranjan's initial instinct had been to teach the mathematical concepts first, then apply them to the project. Instead, the project created urgent need for mathematical tools, and students sought those tools purposefully. This inverted relationship—where learning emerged from doing rather than following learning—challenged everything his teacher training had taught him. He remained uncertain whether this approach would translate into better examination scores, yet he could not deny witnessing mathematical thinking of a sophistication he had rarely seen in conventional lessons.

Smt. Mamata Behera: Drug Addiction Project

Mamata Behera was initially hesitant when students proposed investigating drug addiction in their community. This seemed too sensitive, too complex, potentially controversial what if parents objected, what if students encountered unsafe situations, what if the project surfaced painful realities she was unprepared to handle? Her instinct as a teacher had always been to protect students from difficult topics, to keep the classroom a safe, controlled space focused on academic content. Yet the students persisted. They had seen older siblings and young men in neighboring villages spiral into addiction, destroying families and livelihoods. They wanted to understand why this happened and what could be done. Reluctantly, Mamata agreed, setting strict boundaries—no direct interaction with addicted individuals, community interviews only with parental permission, focus on prevention rather than confrontation.

What unfolded transformed Mamata's understanding of both her students and her pedagogical responsibilities. The students approached the project with remarkable maturity and sensitivity. They researched physiological effects of substance abuse, interviewed health workers about rehabilitation challenges, collected testimonies from families affected by addiction, and created street plays depicting the social and economic devastation addiction caused. Mamata watched students who were typically reticent speak eloquently about peer pressure, unemployment, and hopelessness as addiction's root causes. She saw them grapple with moral complexity—balancing empathy for addicted individuals with anger at the harm inflicted on families. The project's culmination in a community awareness mela, where students presented research findings and performed their street play before hundreds of villagers, was not something any textbook chapter could have achieved. Mamata realized that shielding students from difficult realities was less protective than equipping them with tools to understand and address those realities. Her classroom had become a space for confronting truth rather than avoiding it, and while this brought discomfort and uncertainty, it also brought a sense of education's profound purpose she had not previously experienced.

Reflective Observation of Students

Sunita Mallick: My Solar Village Project

Sunita had always been quiet in school, sitting in the back row, copying notes mechanically, rarely volunteering answers even when she knew them. Her father was a daily wage laborer, her mother worked in agricultural fields, and Sunita was the first in her family to study beyond primary school. When her group chose to work on envisioning a solar-powered village, she felt overwhelmed. Solar energy seemed like something from textbooks, something urban and technical and far removed from her village where electricity itself was erratic. But when the teacher asked students to observe energy use patterns in their homes, Sunita began noticing things she had taken for granted—kerosene lamps that produced dim light and smoky air, her

mother cooking on a firewood chulha that aggravated her chronic cough, mobile phones carried to the town for charging because power cuts lasted days.

The transformation came when Sunita interviewed the sarpanch about why solar streetlights installed two years ago no longer functioned. She discovered that lack of maintenance knowledge, not equipment failure, was the problem. This realization—that solutions existed but required community awareness and ownership—gave her a sense of possibility. She worked with her group to calculate the cost of solar home lighting systems, researched government subsidy schemes, and prepared a presentation advocating for solar adoption. Standing before the community during the project exhibition, explaining how solar panels worked using a model her group had built, Sunita felt something shift inside her. Her voice, which had always been hesitant and barely audible, carried across the room with unexpected confidence. Later, her mother told her that a neighbor had asked about solar cookers after hearing Sunita's presentation. For the first time, school learning felt like something that mattered beyond examinations, something that could touch her family's actual life. She still struggled with English grammar and occasionally felt lost in science theory, but she now believed that her observations, her questions, her ideas had value—a belief no amount of conventional classroom instruction had instilled.

Arjun Digal: Poshan Mela (Nutrition Fair) Project

Arjun loved talking, asking questions, and challenging ideas, which often got him labeled as disruptive in traditional classrooms. Teachers frequently asked him to sit quietly and stop distracting others. When his class undertook the Posan Mela project—organizing a nutrition fair to address malnutrition in the community—Arjun's energy finally found productive direction. His group's task was researching local nutritious foods that were affordable and culturally acceptable but underutilized. Arjun threw himself into this with characteristic enthusiasm, interviewing his grandmother about traditional recipes using ragi, local greens, and forest produce. He learned that foods his family had eaten for generations—which he had sometimes felt embarrassed about compared to packaged snacks his urban cousins consumed—were nutritionally superior. This validation of his community's knowledge felt personally affirming.

The project demanded skills Arjun did not know he possessed. He collaborated with group members to create nutrition charts comparing indigenous foods with commonly consumed items, practiced calculating protein and iron content, and helped design interactive stalls for the fair where children could learn about balanced diets through games. What struck him most was the experience of working with peers who had different strengths—where his enthusiasm and communication skills complemented others' meticulousness in research and artistic abilities in creating visual displays. During the fair, Arjun demonstrated traditional recipes and explained their nutritional benefits to visitors, fielding questions from parents and health workers with a seriousness of purpose he had never brought to textbook recitation. His teacher's feedback—that his ability to engage people and explain complex ideas clearly was a valuable skill—reframed his self-perception. He was not disruptive; he was communicative. He was not distracted; he was curious. The project did not eliminate his restlessness with conventional lessons, but it showed him that education could be dynamic, collaborative, and connected to real community needs—a version of learning where his energy was asset rather than liability.

Minati Naik: Water Conservation Project

Minati was a diligent student who always completed homework, memorized lessons carefully, and scored well on tests. But she rarely understood why she was learning what she learned, and school felt like a series of disconnected facts to be temporarily retained and periodically forgotten. When her class began the water conservation project, Minati approached it as another assignment to be completed for grades. Her group was tasked with mapping water sources in their village and understanding seasonal variations in water availability. She dutifully recorded information, made neat charts, and expected the project to end with a submitted report.

What changed her relationship with learning was an unexpected moment during a field visit to a village pond. An elderly man explained how the pond, which now held water only during monsoons, had been perennial decades ago, supporting fish cultivation and irrigating fields. He described how deforestation in surrounding hills, soil erosion, and siltation had gradually destroyed the pond's capacity. As Minati listened, concepts from her geography and science textbooks watershed management, soil conservation, ecological balance suddenly made visceral sense. These were not abstract terms for examination answers but explanations for a visible, tangible problem affecting her community's survival. Her group decided to propose pond restoration as their project solution, researching desilting techniques, calculating volunteer labor requirements, and presenting a

feasibility plan to village leaders. When the panchayat agreed to initiate restoration work, citing the students' research as motivation, Minati experienced education's power in a way no test score had conveyed. She began seeing connections everywhere between mathematics and resource measurement, between language and persuasive communication, between science and community problem-solving. School was no longer a place where she accumulated disconnected knowledge; it had become a space where learning equipped her to understand and potentially transform her world. This realization did not make her less diligent, but it made her intentional, shifting from studying for grades to learning for purpose.

Conclusion

The study demonstrates that Project-Based Learning, used not only as a pedagogical process but as a generative framework that honors learners' lived experiences while cultivating competencies essential for navigating an increasingly complex world. This study contributes empirical evidence to ongoing conversations about operationalizing India's National Education Policy 2020. Several interconnected insights emerge: PBL's effectiveness is fundamentally tied to its local rootedness projects because that acknowledge students' knowledge of their cultural and traditional practices as legitimate curriculum content rather than deficits to overcome. Teachers' transformation from knowledge transmitters to learning facilitators occurred not through decontextualized training but through sustained, practice-embedded professional development that positioned them as reflective practitioners navigating tensions between syllabus pressures and meaningful learning. Students particularly first-generation learners who had internalized narratives of academic inadequacy discovered agency when their observations mattered, when collaboration honored tribal cultures of collective work, and when projects yielded tangible community outcomes rather than abstract grades. Yet this study also acknowledges inherent limitations: the documented transformation relied on external support infrastructure that may not sustain when withdrawn; the socioeconomic pressures of poverty, seasonal migration, and household labor demands continue to constrain even innovative pedagogy; and the tension between project-based learning and examination-oriented assessment remains unresolved at the systemic level, requiring policy reforms that extend beyond classroom practice to encompass assessment frameworks, teacher education, and curricular flexibility.

Looking forward, the challenge is not merely replicating the Kandhamal model but adapting its underlying principles contextual responsiveness, community integration, teacher agency, student voice to diverse settings while addressing systemic barriers that classroom innovation alone cannot overcome. Scaling PBL in government systems demands curricular structures that position projects as organizing frameworks rather than add-ons, assessment reforms that value demonstrated competencies over rote recall, teacher education programs that prepare facilitators rather than lecturers, and district leadership committed to pedagogical innovation rather than administrative compliance.

Ultimately, this study positions PBL as a context-responsive pedagogy that can transform government classrooms in marginalized communities from sites of cultural erasure to platforms for cultural affirmation, from institutions perpetuating inequality to catalysts for equitable learning. The journey documented here teachers reimagining their roles, students discovering their voices, communities recognizing education's relevance is incomplete and uneven, yet it affirms that the transformative potential envisioned in national policy can materialize in tribal schools when pedagogy centers rather than marginalizes learners' identities, when teachers are supported as professionals rather than mere implementers, and when systemic barriers are addressed with the same seriousness as classroom innovation. The Kandhamal experience contributes both evidence and inspiration to the essential work of moving from rhetoric of educational equity to its realized practice in India's most vulnerable contexts.

Reference:

1. Alshare, K., & Hindi, N. (2004). The importance of presentation skills in the classroom: Students and instructors perspectives. *Journal of Computing Sciences in Colleges*, 19, 6–15.
2. Besa Bytyqi (2021). Project-based learning: a teaching approach where learning comes alive, the journal of teaching English for specific and academic purposes Vol. 9, No 4, Special Issue, 2021, pp. 775–777
3. Giri, Dhundi. (2016). Project-Based Learning as 21st Century Teaching Approach: A Study in Nepalese Private Schools, US-China Education Review A, August 2016, Vol. 6, No. 8, 487-497.

4. Jayashree, S., Awati., U., A., Kamerikar., R., T., Patil., & A., A., Prabhavalikar. (2021). *Implementation of project based learning for best practices activities: A case study*. 2341(1), 020045. <https://doi.org/10.1063/5.0049975>
5. Kolb, A. Y., & Kolb, D. A. (2017b). Experiential learning theory as a guide for experiential educators in higher education. *Experiential Learning & Teaching in Higher Education*, 1(1), 7-44. <https://nsuworks.nova.edu/elthe/vol1/iss1/7>.
6. Mahmoud, H., & Idris, A. (2021). *Problem-based learning (PBL): A Deep approach to learning in the 21st century*. (pp. 38-56). <https://doi.org/10.4018/978-1-7998-4534-8.CH003>
7. New Education Policy. (2020). The Ministry of Education, Government of India. Retrieved from: https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
8. P. Apantee, (2023). The Impact of Project-Based and Experiential Learning Integration on Pre-Service Teacher Achievement in Evaluation and Assessment . *International Journal of Learning, Teaching and Educational Research* Vol. 22, No. 7, pp. 356-370, July 2023 <https://doi.org/10.26803/ijlter.22.7.19>
9. Larmer, J., Mergendoller, J., & Boss, S. (2015b, April 21). Gold Standard PBL: Project Based Teaching Practices [web log comment]. (Adapted from *Setting the Standard for Project Based Learning: A Proven Approach to Rigorous Classroom Instruction*. Arlington, VA: Association for Supervision and Curriculum Development). http://www.bie.org/blog/gold_standard_pbl_project_based_teaching_practices
10. Lone, Showkat & Kour, Simeran Kour. (2024). Vivification of Experiential Learning with Reference to NEP 2020, The International Journal of Indian Psychology ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print) Volume 12, Issue 1, January- March, 2024
11. Pearlman, B. (2006). 21st century learning in schools—A case study of new technology high school in Napa, CA. In E. Schwarz & K. Kay (Eds.), *New Directions for Youth Development*. Retrieved from <http://www.bobpearlman.org/Articles/21stCentury Learning.htm>
12. Thomas, J. W. (2000). A review of research on project-based learning. Retrieved from <http://www.bie.org/images/uploads/general/9d06758fd346969cb63653d00dca55c0.Pdf>
13. Xiaodan Zhou, Ling-Hsiu Chen, & Chin-Ling Chen. (2019). Collaborative learning by teaching: *A pedagogy between learner-centered and learner-driven*. *Sustainability*, 11(4). <https://doi.org/10.3390/su11041174>.

