5. Project Based Learning for Holistic Education

Ms. Gayatri Prakash

Trustee, Delhi Public School, Vadodara, Harni, Bharuch,
Anand Member, Governing Council, Delhi Public School, Gurugram.

Prof. Dr. Geeta R. Thakur

Professor and Dean,
Manav Rachna University.

Dr. Latha Venkataraman

Director, Joy of Learning.

Abstract:

Education is vital for economic growth and sustainable development based on the principles of equity and social justice. According to the NEP 2020, education should create holistic and well-rounded individuals by building cognitive development, 21st century skills as well as character development. NEP 2020 visualizes an interactive teaching learning process that is creative, collaborative, contains fun, exploration and experiential learning.

Holistic education is a comprehensive approach that addresses the physical, intellectual, emotional, creative, social and spiritual aspects of personality to help in the complete development of learners. Project Based Learning (PBL) is a teaching methodology advocated by constructivist and experiential approaches. The students learn by actively engaging in solving real problems or attempting to answer complex questions that are taken up as projects.

The researchers created a "Framework for Suggested Project Based Learning" with learning objectives and expected learning outcomes for school students. The researchers present the case study of Avalon World School located in Waghodia in the state of Gujarat which participated with PBL activities conducted in both the

Primary and the Secondary sections, during the academic year 2023-24. Project-based learning is a pragmatic approach to enable holistic education that breaks the disciplinary boundaries, integrates multiple disciplines into one project, and develops creative thinking, problem raising, problem solving, critical thinking, communication and collaboration. Project based learning techniques help inculcate knowledge, skills and attributes in students that enable their holistic development and growth.

Keywords:

Holistic education; Project-based learning (PBL); NEP 2020; Experiential learning; Student engagement.

5.1 Introduction:

Education is vital for economic growth and sustainable development based on the principles of equity and social justice. The United Nations has set 17 Sustainable Development Goals for peace, prosperity and welfare of all the people of the world. (SDGs) The fourth SDG is 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'. The National Education Policy, 2020 (NEP 2020) visualizes alignment of the Indian education system to bring it in harmony with the goals of modern education, including those put forth in SDG 4.

National Education Policy, 2020 (NEP 2020):

According to the NEP 2020, education should create holistic and well-rounded individuals by building cognitive development, 21st century skills as well as character development. The education system should ensure the move away from mere rote learning toward meaningful understanding of concepts and ideas through inquiry, discovery, discussion, analysis and application of knowledge that all develop and hone critical thinking.

NEP 2020 visualizes an interactive teaching learning process that is creative, collaborative, contains fun, exploration and experiential learning.

Project Based Learning (PBL):

Project Based Learning (PBL) is a teaching methodology advocated by constructivist and experiential approaches. The students learn by actively engaging in solving real problems or issues or attempting to answer complex questions that are taken up as projects. Project work could extend from one week to an entire semester. Project Based Learning taps into the creative energy of students and teachers.

5.2 Holistic Education:

Education has moved beyond the confines of mere transmission and acquiring of knowledge of different subjects as prescribed in the curriculum. Education is now considered to be a lifelong process of personal learning, enrichment and empowerment. Holistic education is a comprehensive approach that believes the teaching learning process must engage children and create a lifelong love of learning.

Holistic education is aligned with the objectives of education set forth by UNESCO. Holistic education aims at equipping learners with the knowledge and life skills needed to face the challenges and obstacles encountered in the turbulent contemporary world we inhabit.

5.2.1 Project Based Learning and Holistic Education:

Holistic education seeks to cultivate the minds of learners and inculcate desirable humanistic values in them. Holistic education addresses the physical, intellectual, emotional, creative, social and spiritual aspects of personality to help in the complete development of learners.

Project based learning goes beyond the transmission of content knowledge flowing in one direction only from the teacher to the learners. It is concerned with learning outcomes that help learners acquire the dispositions and mindsets that are valuable and necessary for them.

"Project-based instructional design is commonly organized around a central or essential question, a set of questions, or a problem." (Barron et al., 1998; Blumenfeld et al., 1991) and "that directs the inquiry." (Wiggins & McTighe, 1998)'Project-based learning requires the combined efforts of the learners, community and teachers for solutions to the proposed questions or problems.' (Helle et al., 2006)'

Project based learning facilitates the developing of capabilities that will lead to future learning' where both cognitive independence and social inter-dependence are encouraged simultaneously. (Garrison & Anderson, 2003) Project based learning is thus a teaching learning methodology that promotes holistic education.

5.3 Review of Related Literature:

Lu Zhang and Yan Ma (2023) showed that compared with the traditional teaching model, project-based learning significantly improved students' learning outcomes and positively contributed to academic achievement, affective attitudes, and thinking skills. J. Vijaya Kumar and Revathy (2023) in their research on "Project-Based Learning: A Catalyst for Student Engagement and Holistic Learning" revealed that PBL as a pedagogical approach has the potential to enhance student engagement and foster holistic learning. The impact on student motivation, critical thinking skills, and real-world applicability advocates for the wider adoption of PBL in educational settings. Anette Markula, Maija Aksela (2022) in the case study "The key characteristics of project-based learning: how teachers implement projects in K-12 science education" studied the way teachers implemented project-based learning (PBL) in science education in Finland.

The results indicated that PBL may specifically promote the use of collaboration, artefacts, technological tools, problem-centeredness, scientific practices like carrying out research, presenting results, and reflection within science education.

But implementation of PBL as a means to learn central content might be challenging. "Education must contribute to the all-round development of each individual - mind and body, intelligence, sensitivity, aesthetic sense, personal responsibility and spiritual values." (UNESCO, 1996: 94)

In "Project-Based Learning Technique for Holistic Development of Students" Pratima Kulkarni and Dipali Ramdasi (2022) present project-based learning as a strong pedagogy tool for the overall development of students. PBL includes student-centred activities that are inquiry-based and rooted in active learning. But PBL does not apply well in all disciplines, nor do all educators choose to utilize PBL for their individual disciplines. According to Jonathan Cohen (2006) in the research article "Social, Emotional, Ethical, and Academic Education:

Creating a Climate for Learning, Participation in Democracy, and Well-Being", the development of academic learning as well as social, emotional, and ethical competencies all have to be given importance in education. Not heeding social, emotional, ethical, and academic education is tantamount to injustice towards students. The research report "A Review of Research on Project-Based Learning" by John W. Thomas, (2000) indicated that PBL improved the quality and increased the capability of learning of students in novel, problem-solving contexts. PBL is effective for teaching students planning, communicating, problem solving, and decision making.

There is also some indirect evidence that PBL becomes more effective when incorporated into whole-school change efforts.

5.4 Project Based Learning – A Case Study:

The researchers created a **Framework for Suggested Project Based Learning** that set out learning objectives and expected learning outcomes for school students. This was shared with the Principal and Teachers of a CBSE school in Gujarat.

Avalon World School located in Waghodia in the state of Gujarat participated in the project, with PBL activities conducted in both the Primary and the Secondary sections, during the academic year 2023-24.

The Primary Section consists of Grades 1 to 5 while the Secondary Section consists of Grades 6 to 10.

The researchers collected firsthand information about the activities conducted through Project Based learning in the school. The data revealed the outcomes of PBL as well as the challenges faced in implementing PBL.

5.4.1 PBL in Primary Section (Grades 1 to 5):

Based on the suggested framework, the activities conducted through PBL in the Primary Section included the following:

1. Story Enactment: Students showcased their acting skills and understanding of narrative elements through story enactment.
2. Mimicry: Students demonstrated mimicry skills imitating famous English-speaking personalities.
3. Yoga Demonstration: Students exhibited the understanding of angles through Yoga and dance.
4. Science Extravaganza: Students dressed up as various scientists and presented their contributions. They also demonstrated application of the research and findings made by those scientists.

5. Models: Students demonstrated various concepts through the working models to understand the critical concepts more easily.

6. Interdisciplinary Projects: Students made projects on topics in which they integrated aspects from different subjects. For e.g. the topic 'Water' was given to students who researched and drew the water cycle, found out information about the water consumption in five households in their neighborhood and then used the information to write an article about the need to conserve water in Hindi.

7. 'Matra Gyan' Activity: Students demonstrated various 'matras' of Hindi through dance. The activity was conducted during the 'Hindi Language Week'.

8. Skit: Skit related to the Environment Day was presented by the students creating awareness about conserving water and other valuable elements of the Earth.

9. Maths Games: Games related to Mathematics were conducted in 'Mathematics Week' to explore mathematical concepts and understand them easily.

10. Poetry Recitation: 'Poem Recitation Competition' was conducted to enjoy the beauty of poetic language.

11. Spell Bee: To improve the vocabulary of the students, 'Spelling Bee' was conducted.

12. G. K. Quiz: This helped to impart general knowledge to the students.

13. Maths Quiz: This helped to improve the mathematical ability of counting.

14. Role Play: Role Play Activity based on the theme "Freedom Fighters of India" was conducted in the school to inculcate the national spirit. It also enhanced the knowledge of India's Historical Treasures.

15. "Avoiding the usage of Plastic": Making the students use Jute bags instead of plastic as well as asking the students to promote the same at their homes and in their neighborhood and communities, helped in practical environment education.

5.4.2 PBL in Secondary Section (Grades 6 to 10):

Based on the suggested framework, the activities conducted through PBL in the Secondary Section included the following:

1. Virtual Tour Guide: Students created virtual tour guides of famous English speaking countries providing insights into their culture, history and landmarks.
2. Story Enactment: Students showcased their acting skills and understanding of narrative elements through story enactment.
3. Mimicry: Students demonstrated mimicry skills imitating famous English-speaking personalities.
4. Language Games: Interactive language games were organised to make learning English enjoyable and engaging, reinforcing vocabulary and grammar concepts.
5. Debate: Students engaged in debates on the topics related to communication and education honing the critical thinking and public speaking skills.
6. Earth Day: Students demonstrated the analogy representing the Earth and Plastic. They demonstrated the disadvantages of using plastic and suggested the ways to protect the planet.
7. Puzzles: Students created and presented puzzles related to mathematical operations to understand the concepts in the play-way method.
8. Models: Students demonstrated various concepts through the working models to understand the critical concepts more easily.
9. Yoga Demonstration: Students exhibited their understanding of Geometry by presenting the concept of Angles through Yoga and dance.
10. 10)"Nukkad Natak": Students presented the skit based on "Nasha Mukti" to create awareness about the consequences of various addictions. Another "Nukkad Natak" related to Mathematics was presented to make students aware about the usage of Mathematical concepts in their day to day lives.
11. Environmental Awareness programme: The students developed a project entitled "Avoiding the usage of Plastic". The students themselves made use of

Jute bags instead of plastic. They spread awareness about the need for reducing plastic usage. They actively promoted use of jute bags instead of plastic bags in their neighborhoods, thus working practically towards protecting the environment and environmental education.

12. Tree Plantation: The Tree plantation drive helped students to plant trees and take care of them. It made them realize that time and hard work are necessary for growing trees. It created awareness about the need for planting trees in their surroundings.

13. Creating Unique Games: Students created unique games based on Social Science like "Snakes and Ladders", Flag game etc. which fostered understanding of the subject and gave students a chance to unleash their creativity.

14. Interdisciplinary Projects: Students made projects where on the same topic they had to integrate different subjects. For e.g. when given the topic 'Water', students found out and drew the water cycle, found about water consumption in Five houses in their neighborhood, wrote an article in Hindi, about the need to conserve water.

5.4.3 Learning Outcomes of PBL in the Primary Section:

- **Communication Skills:** Students get acquainted with the actual usage of language which promoted the skill of communicating effectively.

- **Practical Use of Knowledge:** Students learned to use the knowledge and the ideas learnt in the class practically in real life situations.

- **Social and Environmental awareness:** The different project works created social and environmental awareness and helped to sensitise students about different problems and issues faced in the immediate neighbourhood and in the wider world.

- **Environmental Protection:** Awareness about environmental issues created out of the various projects conducted by the school has resulted in practical measures and initiatives to protect the environment.

- **Correlation of theory and practice:** Students understood how to correlate theoretical information with actual situations.
- **Problem solving:** The activities allowed the students to explore and practise solutions to complex issues, in a controlled environment.

5.4.4 Learning Outcomes of PBL in the Secondary Section:

- Students get acquainted with the actual usage of the language and it promoted communication effectively.
- They gained the knowledge to use the concepts they have learnt in the class, in actual situations.
- The projects created social, environmental awareness as well as sensitised them with various issues of the society.
- The environmental awareness created out of various projects conducted has been helpful to protect the environment.
- Students understood how to correlate theoretical information with actual situations.

5.4.5 Challenges Faced in PBL in Primary Section:

- **Engagement:** Keeping students actively engaged and motivated.
- **Differentiation:** Addressing diverse learning needs and styles.
- **Stress:** Managing test anxiety and its impact on performance.

5.4.6 Challenges Faced in PBL in the Secondary Section:

- Sometimes there is difficulty in obtaining concise, authentic and valid information regarding a particular project.
- Having a dynamic group of students caused difficulty in the setting of goals for the projects.

- Organizing the materials as well as managing the tools needed for the project work was time consuming and created hardship for the teachers and the learners.
- Availability of resources at the right time and in the right quantity was an issue.

5.4.7 Suggestions for improvements in Primary Section:

Feedback from teachers and school leaders provided some insights into what could be done to improve the outcomes from Project based learning in the Primary Section.

- Seeking complete information from various sources.
- Getting parental involvement.
- Making use of the resources which are available and outsourcing, if needed.

5.4.8 Suggestions for improvements in Secondary Section:

Feedback from teachers and school leaders provided some insights into what could be done to improve the outcomes from Project based learning in the Secondary Section.

- Enhance the activities to improve student engagement.
- Provide diverse resources; offer different materials and resources to cater to different learning styles.
- Warm-up activities can be planned to reduce stress and anxiety of students.

5.5 Conclusion:

Project-based learning is a pragmatic approach to enable holistic education that breaks the disciplinary boundaries, integrates multiple disciplines into one project, and develops creative thinking, problem raising, problem solving, critical thinking, communication and collaboration. Project based learning (PBL) is an approach to instruction that believes that students should actually perform tasks for an engaging, meaningful learning process.

Project based learning techniques help inculcate knowledge, skills and attributes in students that enable their holistic development and growth.

5.6 Appendix 1:

Table 5.1: Framework for Suggested Project Based Learning:

Project	Learning Domains	Integration of Subjects	Learning Objectives	Key Activities	Learning Outcomes	Assessment Criteria
"GO GREEN"	Cognitive; Psycho-motor; Affective	Science, Geography, Art, IT	Make the campus eco-friendly	Tree planting; Water Conservation Awareness Campaign; Art Installations from recycled materials	Creation of Recycled art installations; Campus-wide plastic recycling program	Environmental awareness, Creativity, Collaboration, Presentation skills
"Cultural Kaleidoscope"	Cognitive, Social, Emotional	History, Geography, Art and Craft, Language	Explore and showcase local heritage	Research on local heritage, create models of landmarks, cultural performances	Heritage exhibition with models and cultural performances	Understanding of cultural history, creativity, teamwork, Communication, public speaking
"MATHEMAGIC"	Cognitive, Practical	Mathematics, Art, IT	Apply mathematical concepts in real-life scenarios	Investigate angles in yoga/architecture, create visual models of math concepts using technology	Math fair with models, puzzles, and math-themed art	Problem-solving, application of math, creativity, and presentation

Project	Learning Domains	Integration of Subjects	Learning Objectives	Key Activities	Learning Outcomes	Assessment Criteria
"What's Cooking? - Culinary Skills Workshop	Practical, Social	Health, Science	Promote healthy eating habits and life skills	Cooking healthy meals, creating recipes, discussing nutritional value	Food presentation, recipe book	Culinary skills, teamwork, health awareness
"We FEEL You" -Theater and Empathy Project	Emotional, Social	Performing Arts, Literature	Build empathy and communication skills	Script writing, role-playing, acting in socially relevant plays	Theatrical performance on empathy and social issues	Emotional intelligence, communication, creativity, teamwork
"Just Do IT"- Tech for Social Good	Cognitive, Practical	IT, Science, Social Studies	Use technology to solve social issues	Coding a solution (app/website) for a local issue, e.g., waste management	App/website demo, presentation	Innovation, technology application, problem-solving, community impact
"Speak Up" - Orators' Club Debate	Emotional, Social	Language, Social Studies	Develop public speaking and leadership skills	Debates on current issues, storytelling, extempore activities	Debate competition, extempore performance	Public speaking, critical thinking, leadership, persuasion skills
"It's All About Sports"	Physical, Emotional	Physical Education, Health	Foster physical fitness and	Organize sports activities, wellness	Sports competition, fitness routines,	Physical fitness, teamwork, resilience,

Project	Learning Domains	Integration of Subjects	Learning Objectives	Key Activities	Learning Outcomes	Assessment Criteria
- Sports for Healthy Life			emotional resilience	workshops, yoga sessions	wellness campaign	emotional regulation
"Save Earth" - Recycling Awareness Campaign	Social, Practical	Environmental Science, Art	Raise awareness about recycling and sustainability	Organize an e-waste drive, create posters and presentations on recycling	E-waste collection drive, posters, school presentation	Environmental consciousness, creativity, initiative, communication skills

5.7 References:

1. https://sdgs.un.org/2030agenda

2. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

3. https://www.pblworks.org/what-is-pbl

4. https://www.psychology.org/resources/educational-psychology-theories/

5. https://files.eric.ed.gov/fulltext/EJ938579.pdf

6. https://diser.springeropen.com/articles/10.1186/s43031-021-00042-x

7. https://diser.springeropen.com/articles/10.1186/s43031-021-00042-x

8. http://www.bobpearlman.org/BestPractices/PBL_Research.pdf

9. https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2023.1202728/full

10. https://teaching.ieee.org/project-based-learning-a-catalyst-for-student-engagement-and-holistic-learning/

11. https://www.journaleet.in/articles/project-based-learning-technique-for-holistic-development-of-students

12. https://edtechbooks.org/studentguide/project-based_learning?format=ms_word

13. https://psycnet.apa.org/record/2006-10186-007

14. https://www.researchgate.net/publication/352977987_Project-based_Learning_in_21st_Century_A_Review_of_Dimensions_for_Implementation_in_University-level_Teaching_and_Learning/citation/download

15. https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2022.938931/full

16. https://mgiep.unesco.org/project-based-learning

17. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10044071/

18. https://www.jstor.org/stable/48736793

19. https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2022.751801/ful