CHAPTER SIX

PROJECT BASED LEARNING

Project-Based Learning (PBL) stands as a cornerstone of STEAM education, where science, technology, engineering, arts, and mathematics converge to offer students an immersive and holistic learning experience. At its core, PBL centers on the idea that students learn best when they engage with real-world challenges and actively apply their knowledge and skills to solve complex problems.

In STEAM, PBL projects empower students to become investigators, designers, and innovators, immersing them in hands-on, collaborative experiences.

These projects can range from designing sustainable solutions to tackling engineering challenges, creating art with mathematical precision, or even crafting scientific experiments. PBL in STEAM not only equips students with deep subject knowledge but also hones their critical thinking, creativity, and teamwork, ultimately preparing them to excel in the multifaceted, interdisciplinary world they will encounter beyond the classroom.

It nurtures a passion for exploration, discovery, and lifelong learning while bridging the gap between theoretical knowledge and practical application in the diverse fields that STEAM encompasses.

STEPS IN IMPLEMENTING PROJECT BASED LEARNING

- **Defining the Problem:** Start with students asking questions to frame the problem context and potential benefits for end users.
- **Generating Ideas:** Encourage brainstorming to generate a variety of ideas while focusing on the problem.
- **Prototyping Solutions:** Create prototypes, like mock-ups or role-plays, to expand on ideas and convey potential solutions.
- **Testing:** Test prototypes in real settings to gather feedback, identify issues, and engage in critical thinking and reflection.

THE ROLE OF THE TEACHER IN IMPLEMENTING PBL

01

Facilitator

The teacher guides students through the PBL process, helping them define project goals, identify resources, and develop a plan. They support students in setting achievable milestones and encourage them to take ownership of their learning.

02

Designer

The teacher designs and structures the overall project framework. They create a well-defined driving question or problem statement that aligns with STEAM concepts and encourages critical thinking and exploration.

03

Content Expert

The teacher provides foundational knowledge and content related to the project. They introduce key STEAM concepts, theories, and skills, ensuring that students have the necessary background to tackle the project effectively.

04

Resource - Provider

The teacher curates resources such as reference materials, tools, software, and equipment that students may need during the project. They offer guidance on how to access and utilize these resources effectively.

05

Collaborator

Collaborator: The teacher collaborates with students, working alongside them as a co-learner. This emphasizes the teacher's willingness to explore and discover new information, fostering a culture of collaboration and shared learning.

THE ROLE OF THE TEACHER IN IMPLEMENTING PBL

06

Connector

The teacher helps students connect the project to real-world applications and contexts. They emphasize how the STEAM concepts being learned are relevant in professional fields and everyday life.

07

Assessment Design

The teacher designs assessments that evaluate both content knowledge and skills acquired during the project. These assessments can include presentations, portfolios, demonstrations, and reflections, assessing not only the final product but also the learning process.

08

Promoter of Reflections

The teacher encourages students to reflect on their learning experiences, challenges faced, and lessons learned throughout the project. Reflection fosters metacognition and helps students understand their growth.

09

Cultivator of Curiosity

The teacher sparks curiosity and encourages inquiry by posing thought-provoking questions, suggesting intriguing avenues of exploration, and facilitating discussions that promote deeper understanding.

10

Time and Task Manager

The teacher assists students in managing their time effectively to meet project deadlines. They help students break down the project into manageable tasks and ensure progress is being made.

THE ROLE OF THE TEACHER IN IMPLEMENTING PBL

11

Adaptive Facilitator

The teacher adapts to students' individual learning styles, needs, and interests. They provide personalized support to each student, ensuring that the project meets their educational goals.

EXAMPLES OF PBL ACTIVITIES

- *Planning a climate Smart Garden, that meets specific designs and promotes green environment*
- *Launching a recycling program that solves an identified problem with existing recycling programs. This can be done at a school-level, neighborhood-level, or city-level.*
- *Solving the problem of negative and/or 'fake news.'*
- *Designing a new form of government (or democracy, specifically) that addresses some perceived shortcoming of existing democratic forms (partisanship, non-functioning checks-and-balances, etc.)*
- *Helping local businesses increase environmental sustainability (e.g., reduce waste).*

CLASS ACTIVITY

Choose any of the challenge below:

1. Unemployment
design a project that best addresses unemployment among youths.

2. Preventing soil erosion
build a seawall to protect a coastline from erosion, calculating wave energy to determine the best materials for the job.

3. Solving a city's design needs
Identify issues relating to things like transportation, the environment, or overcrowding – and design solutions.

4. Creating clean water
Build a water filtration system to promote access to clean water.

5. Improving the lives of those with disabilities
Using the materials available to you, to build an assistive aid to help a person with a disability move or carry stuff easily.

6. Building earthquake-resistant structures
Using the popsicle sticks to construct an earthquake resistant structure

Technology is just a tool in terms of getting the kids working together and motivating them. The teacher is the most important

BILL GATES