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Fostering Practical Skills in Adolescents through Task-Based Learning: A Study on Collaboration, Problem-Solving, and Critical Thinking

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Abstract

Developing collaboration, critical thinking, and problem-solving are essential life skills of students for facing real-life challenges in the learning process. This study explores how experiential and task-based learning can foster these skills among students in 5th, 6th, and 7th grades. A qualitative observational study was conducted with 42 randomly selected students, who participated in three hands-on activities: (1) Watering the Plants where one group worked without strategy, while another planned collaboratively, (2) The Cadbury Challenge where students formed teams to solve a purchasing problem, and (3) Bio-Waste Management where students devised a sustainable solution for school waste.

Data was collected through observational notes, video recordings, and student reflections. Comparative and thematic analysis revealed that students who engaged in structured planning and teamwork performed tasks more effectively; demonstrating enhanced problem-solving abilities, decision-making skills, and critical thinking. Reflection-based insights also highlighted how students became aware of the importance of strategic collaboration in overcoming challenges.

The findings suggest that incorporating experiential learning into school curricula can significantly enhance the practical skills of students. By engaging in real-world problem-solving tasks, students not only develop cognitive and social skills but also build confidence in handling challenges independently. This study underscores the importance of integrating hands-on activities in education to equip students with the necessary skills for academic and personal success.

Keywords: *Adolescent education, practical skills, collaboration, problem-solving, critical thinking, task-based learning, experiential learning.*

Introduction

Adolescence, generally well-defined as the period between 10 and 19 years of age, represents one of the most crucial and transformative stages of human development. This phase is characterized by rapid and interconnected physical, emotional, social, and intellectual changes that significantly influence an individual's personality and future life outcomes. During adolescence, students experience noticeable physical growth alongside hormonal changes, which often impact their emotions, behaviour, and self-perception. At the same time, cognitive development accelerates, enabling adolescents to think more conceptually, reason logically, and engage in critical and reflective thinking.

As adolescents mature, they begin to develop a stronger sense of identity and self-awareness, striving for independence while seeking acceptance from peers and society. This period is marked by heightened curiosity and exploration, as young individuals question established ideas, form personal values, and discover their interests and aspirations. Such exploration is essential for intellectual growth but may also lead to confusion, emotional vulnerability, and internal conflicts.

Adolescents frequently encounter various challenges, including peer pressure, academic expectations, emotional stress, and the difficulty of balancing educational responsibilities with social relationships. These challenges, if not addressed constructively, can affect their mental well-being, motivation, and academic performance. In this context, schools play a central role in supporting adolescents through this transitional phase. By fostering a safe, inclusive, and encouraging learning environment, schools can help students develop resilience, emotional regulation, and self-confidence.

Additionally, educational institutions are responsible for promoting practical skills, life skills, collaboration, and problem-solving abilities, which are essential for both personal growth and future employability. Through guided mentorship, experiential learning, and value-based education, schools can empower adolescents to navigate challenges effectively and emerge as responsible, confident, and capable individuals prepared for adulthood.

Importance of Teaching Practical Skills to Adolescents

Adolescence is a crucial stage of life when young people start developing independence and preparing for adulthood. While academic knowledge is important, practical skills like teamwork, decision-making, and adaptability play a key role in their future success. Schools often focus on theoretical learning, but real-life challenges require students to think on their feet, communicate effectively, and handle unexpected situations. When adolescents are taught practical skills through hands-on activities, they gain confidence in tackling problems, working with others, and making informed decisions.

Need for Collaboration in Real-Life Situations

Collaboration is an essential skill in almost every aspect of life, from school projects to professional careers. In the real world, very few tasks are done alone people need to work together, share ideas, and find solutions as a team. When adolescents participate in group activities, they learn to listen to others, respect different perspectives, and contribute meaningfully. Strong collaboration skills help them build positive relationships, resolve conflicts, and achieve goals efficiently, making them valuable team members in any setting.

Need for Problem-Solving and Critical Thinking in Real-Life Situations

Problem-solving and critical thinking are essential life skills, especially in challenging situations. These skills help students analyze situations and find effective solutions. With the help of such skills, students can handle tough school assignments, manage time effectively, and make important personal decisions. By practicing problem-solving through activities like brainstorming, decision-making tasks, and real-life simulations, adolescents become better equipped to tackle everyday challenges. These skills also prepare them for future careers.

In addition to academic knowledge, students need practical skills like collaboration, problem-solving, and critical thinking to navigate real-life challenges in a fast-changing world. However, traditional education systems, especially in India, have often focused on rote learning, limiting students' ability to apply knowledge in practical situations (Lone & Kour, 2024). To address this gap, educators and policymakers are increasingly promoting experiential learning, which enables students to learn through hands-on experience rather than merely memorizing facts.

Experiential learning, as defined by Kolb (1984), focuses on hands-on experiences that allow learners to bridge the gap between theory and real-world applications. This approach is especially significant in the context of India, where the National Education Policy 2020 (NEP 2020) advocates for a shift from traditional rote learning to activity-based and inquiry-driven education (Jan & Parveen, 2024). The NEP 2020 emphasizes the need for holistic, flexible learning experiences, urging schools to incorporate real-life problem-solving activities into the curriculum. This shift not only fosters deeper learning but also equips students with the practical skills required to thrive in an ever-evolving world. Experiential learning equips students for real-world situations by transforming them into active participants in their education, rather than passive recipients of information (Jan & Parveen, 2024).

Research indicates that when students actively engage in learning through tasks and challenges, they develop essential life skills more effectively (Thankachan, 2024). For instance, structured group activities encourage collaboration, strategic planning, and decision-making—core components of problem-solving and critical thinking. Furthermore, studies have demonstrated that incorporating elements such as puzzles and strategic games into education can significantly enhance students' ability to think critically and solve problems creatively (Rubik, 2025). These interactive approaches not only deepen learning but also prepare students to tackle real-world challenges with confidence and innovation.

Objectives

- To examine the role of experiential learning in fostering practical skills such as collaboration, problem-solving, and critical thinking among adolescents in school settings.
- To explore how hands-on activities can bridge the gap between theoretical knowledge and real-world applications.
- To analyze the impact of collaborative learning activities on the development of teamwork, communication, and decision-making abilities in adolescents.
- To assess the effectiveness of problem-solving and critical thinking tasks in enhancing adolescents' ability to analyze complex situations, think creatively, and find practical solutions.
- To investigate the alignment of the NEP 2020 with the integration of experiential learning in schools, particularly focusing on its promotion of activity-based and inquiry-driven education.

Research Questions

1) How do task-based activities influence adolescents' collaboration, problem-solving, and critical thinking skills?

2) What are the differences in outcomes between students who work with a planned strategy and those who work without one?

3) How does experiential learning contribute to the development of practical skills in adolescents?

Literature Review

This literature review explore about the adolescence life circle and their problems related learning process, adolescence is an important stage of life when students go through many physical, emotional, and mental changes. During this period, students develop better thinking abilities but are also more sensitive to stress, peer pressure, and emotions. Steinberg (2005) explains that adolescents are capable of logical and critical thinking, yet they need proper guidance to manage emotions and decision-making. NEP 2020 also recognizes adolescence as a key stage and highlights the need for education that supports both academic learning and emotional well-being.

Social relationships strongly influence students' learning and motivation. Wentzel (1998) found that positive relationships with teachers, parents, and peers help students stay motivated and engaged in school. When students feel supported and respected, they perform better academically and socially. NEP 2020 emphasizes creating a safe, inclusive, and supportive school environment where students feel confident to express themselves and learn collaboratively.

Experiential learning is a powerful method for teaching adolescents. Kolb (1984) explains that students learn best when they learn by doing, reflecting on their experiences, and applying what they learn in real situations. This idea strongly matches NEP 2020, which promotes experiential, activity-based, and learner-centred education instead of rote memorization. Yardley et al. (2012) also state that experiential learning helps students connect classroom knowledge with real life.

Research studies show that experiential learning improves students' social and emotional skills. Chan et al. (2021) found that such programs help adolescents develop empathy, cooperation, and a sense of well-being. Similarly, Karasimopoulou et al. (2012) reported that health education combined with social skills training

improves students' quality of life. These findings support NEP 2020's focus on life skills, emotional development, and holistic education.

Task-based learning is another effective approach for adolescent education. Ellis (2003) explains that task-based learning involves meaningful activities related to real-life situations, which makes learning more interesting and practical. Carless (2007) found that task-based learning works well in secondary schools when teachers adapt it to students' needs and curriculum goals. NEP 2020 supports such flexible teaching methods that encourage critical thinking, creativity, and problem-solving.

The use of technology and innovative methods also supports experiential learning. Kolić-Vehovec et al. (2020) showed that educational games can help students understand social issues like bullying and improve their behaviour. Kruger et al. (2015) found that real-world learning experiences help students become more responsible and reflective. NEP 2020 strongly promotes the use of technology, digital tools, and real-life learning experiences to make education more meaningful and engaging.

In conclusion, the reviewed studies clearly show that experiential and task-based learning methods are highly effective for adolescents. These approaches help students develop academic knowledge along with life skills such as communication, empathy, teamwork, and problem-solving. NEP 2020 supports these methods by encouraging holistic development, experiential learning, and student-centred education. Hence, schools should adopt these approaches to help adolescents grow into confident, skilled, and responsible individuals.

Methodology

Research Design

This study adopts a qualitative, observational research design to explore the impact of experiential and task-based learning activities on the development of collaboration, problem-solving, and critical thinking skills in students. Through a combination of direct observation, video recordings, and reflective discussions, the research captures students' engagement, interactions, and skill progression during the activities. This comprehensive approach allows for an in-depth analysis of how these learning strategies facilitate practical skill development and foster meaningful learning experiences.

Participants

The study involved 42 students from 5th, 6th, and 7th grades, selected through random sampling to ensure a diverse representation of academic backgrounds and skill levels. This selection aimed to capture a balanced mix of learning abilities and social dynamics within the group. To foster collaboration, problem-solving, and critical thinking skills among adolescents, three meticulously designed activities were conducted. Each activity required students to engage in hands-on tasks, make informed decisions, and collaborate effectively to find innovative solutions, ensuring a comprehensive approach to skill development.

Activity 1: Watering the Plants – Strategy vs. No Strategy

This activity was designed to emphasize the importance of planning and teamwork in achieving efficient outcomes. Two groups of 11 girls each were tasked with watering the plants in the schoolyard, using a water tank, pots, and buckets as their resources.

- Group 1 began the task immediately, with no prior discussion or planning. They randomly selected containers and began fetching water, leading to overlapping efforts and inefficient use of time and resources.
- Group 2, on the other hand, adopted a more strategic approach. Before starting, they gathered to discuss and allocate roles some student's fetched water, while others carefully poured it to avoid wastage and ensure optimal use of resources.

When comparing the two groups, it was clear that planning and collaboration enhanced task efficiency. Group 2 completed the task more quickly, used water more with care, and worked in a more organized manner. This activity underscored the value of strategic thinking and effective teamwork in achieving successful and efficient outcomes.

Activity 2: The Cadbury Challenge – Learning Collaborative Decision-Making

This activity was designed to foster problem-solving skills and enhance collaborative decision-making in financial contexts. Ten students were each given 5 rupees and tasked with purchasing a 20 Cadbury chocolate from a local shop.

- Initially, each student attempted to buy the chocolate individually but quickly realized that they did not have enough money to make the purchase.
- After several unsuccessful attempts, a few students began discussing the problem. They soon recognized that by pooling their resources, they could collectively afford the chocolate.
- Eventually, two groups of five students each collaborated, sharing their money, and successfully purchased the 20 Cadbury.

This activity vividly demonstrated the power of teamwork, resource-sharing, and collective decision-making. It highlighted how collaborative problem-solving can often lead to more efficient and effective solutions.

Activity 3: Bio-Waste Management – A Sustainable Solution

This activity challenged students to apply critical thinking while promoting environmental awareness and sustainability. The task was to devise a solution for managing the dry leaves and bio-waste accumulating in the schoolyard.

- Initially, the students observed the growing issue and discussed possible solutions. Some suggested sweeping and discarding the waste, but others quickly realized that this approach would not provide a long-term solution.
- After a period of brainstorming, one group proposed composting the bio-waste, transforming it into organic fertilizer for the school garden a more sustainable and eco-friendly option.
- The students then conducted research, learning the essential steps of composting: collecting dry leaves, incorporating kitchen waste, and maintaining the right moisture levels for effective decomposition.
- Under the guidance of their teacher, they implemented their idea, setting up a composting pit in a designated area of the school.

Data Collection

To evaluate the impact of the activities on developing collaboration, problem-solving, and critical thinking skills, data was collected through a triangulation of methods: observational notes, video recordings, and student reflections. Throughout the activities, researchers meticulously observed and documented key aspects of student behavior, providing rich qualitative insights into how students naturally approached and responded to problem-solving situations.

All three activities were recorded on video to capture real-time interactions and decision-making processes. The videos offered a more detailed and nuanced analysis of student behaviors, enabling researchers to examine moments and actions that may not have been fully captured through direct observation alone.

Data Analysis

The collected data was analyzed using a combination of comparative analysis, thematic analysis, and reflection-based insights to evaluate how the designed activities facilitated the development of collaboration, problem-solving, and critical thinking skills among the students.

1. Comparative Analysis of Students' Approaches with and without Strategy

The "Watering the Plants" activity offered a clear comparison between unplanned execution and strategic teamwork.

- **Group 1 (without Strategy)**: This group faced numerous challenges, including disorganized efforts that led to water wastage and inefficient task distribution. Some students ended up doing more work than others, creating imbalances and frustrations within the team.
- **Group 2 (with Strategy)**: In contrast, the second group, which employed a pre-task discussion and strategy, exhibited:

- **Effective role distribution**, ensuring equal participation from all members.
- **Minimized water wastage** through systematic carrying and pouring.
- **Faster completion time**, driven by efficient teamwork and a clear division of tasks.

2. Thematic Analysis of Collaboration, Problem-Solving, and Critical Thinking Behaviors

The data from video recordings and observational notes were analyzed thematically to uncover recurring patterns in student behavior across all activities. Key themes included:

- **Collaboration**: In the *Cadbury Challenge*, students initially attempted to complete the task individually but soon realized the need for collaboration. They naturally formed small groups to discuss and pool their resources, illustrating how real-life challenges often prompt individuals to shift from solo efforts to collective teamwork.
- **Problem-Solving**: In the *Bio-Waste Management* activity, students began by considering short-term solutions such as simply collecting and discarding the dry leaves. However, as they engaged in deeper reflection, they pivoted towards a more sustainable solution: composting the bio-waste to create organic fertilizer. This shift demonstrated an evolution in their problem-solving skills
- **Critical Thinking**: Across all three activities, students engaged in reflection, actively evaluating what strategies worked and what didn't. This reflective process highlighted the development of strategic thinking and awareness, underscoring the importance of critical reflection in the learning process.

3. Reflection-Based Insights from Student Feedback

Students' post-activity reflections provided rich qualitative data that illustrated the impact of the activities on their thinking and skill development. Some key insights included:

- **Student A**: "At first, I just wanted to finish my work quickly, but then I realized talking to my team made things easier." *(Collaboration)*
- **Student B**: "If we had planned earlier, we wouldn't have wasted so much time." *(Strategic Thinking)*
- **Student C**: "I never thought we could turn dry leaves into compost, but now I understand how waste can be useful." *(Critical Thinking & Problem-Solving)*

These reflective responses underscored the value of experiential learning in deepening understanding. The students recognized the importance of collaboration, planning, and creative problem-solving.

Findings

The analysis of observational notes, video recordings, and student reflections revealed several key findings that underscore the impact of experiential and task-based learning on students' development of collaboration, problem-solving, and critical thinking skills.

1. Strategic Planning Enhances Efficiency and Problem-Solving

The study found that groups who engaged in strategic planning before executing tasks performed more efficiently than those who worked without a strategy. In the *Watering the Plants* activity, the group that took time to plan used water with care, minimized wasted effort, and completed the task faster than the group that proceeded without planning. Similarly, in the *Cadbury Challenge*, students who initially worked individually soon realized the importance of collaboration and resource pooling. This shift in approach highlighted how strategic decision-making is essential for both efficient task completion and effective problem-solving.

2. Collaboration Naturally Emerges When Facing Challenges

While students initially approached the tasks individually or in an unstructured manner, all groups gradually shifted toward collaboration when they encountered obstacles. This natural progression from individual effort to teamwork was particularly evident in the *Cadbury Challenge* and *Bio-Waste Management* activities. In both cases, students' ability to collaborate led to more effective problem-solving and resource management. These findings suggest that peer interaction encourages teamwork, even among students who initially prefer to work independently, demonstrating the importance of collaborative skills in real-world problem-solving scenarios.

3. Hands-On Experiences Strengthen Critical Thinking

Experiential learning prompted students to develop critical thinking skills by encouraging them to reflect on real-world challenges. In the *Bio-Waste Management* activity, students initially proposed quick fixes, such as simply discarding the waste. However, through guided reflection and brainstorming, they ultimately developed a sustainable solution—composting. This shift in problem-solving demonstrated that real-world challenges encourage students to think critically and explore more innovative and long-term solutions. The study revealed that hands-on experiences foster a deeper understanding of cause-and-effect relationships, stimulating students to think beyond immediate answers and consider broader, more sustainable solutions.

4. Reflection and Experience Lead to Self-Awareness

Student reflections highlighted the role of self-awareness in the learning process. After completing the activities, students were more cognizant of their decision-making processes and actions. Many students, like *Student B*, acknowledged the importance of planning and strategy in enhancing efficiency, saying, "If we had planned earlier, we wouldn't have wasted so much time." Such feedback indicates that students internalized the lessons learned through the activities, reflecting on their performance and recognizing areas for improvement.

5. Task-Based Learning Encourages Independent Decision-Making

All three activities provided students with the autonomy to make decisions about how to approach tasks. This freedom encouraged them to take ownership of their actions and decisions, fostering a sense of responsibility and accountability. By the end of the activities, students exhibited increased confidence in making independent decisions. This development is crucial, as it nurtures life skills that go beyond the classroom, preparing students for real-world challenges where critical thinking, decision-making, and responsibility are essential. Task-based learning, therefore, not only enhances academic skills but also promotes personal growth and autonomy.

Conclusion

This study explores the role of experiential and task-based learning in developing key skills like collaboration, problem-solving, and critical thinking in adolescents. By engaging students in real-world tasks, such as watering plants and managing bio-waste, the study highlights how teamwork, strategic planning, and critical thinking improve task efficiency and problem-solving abilities.

The findings emphasize the value of integrating experiential learning into curricula, showing that students who engage in reflective practices and collaborative efforts demonstrate stronger problem-solving, teamwork, and self-awareness. These results support the goals of the National Education Policy 2020 (NEP), which advocates for a holistic, inquiry-driven education.

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