



## **Experiential learning: an experiment with new ideas and receive feedback in a safe environment**

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**Abstract:** Outcome-based experiential learning is an approach to education that focuses on the practical application of knowledge and skills, with a particular emphasis on achieving specific learning outcomes. FM radio-based experiential learning is an innovative approach to education that leverages the use of FM radio as a platform for hands-on, practical learning experiences. This method involves utilizing FM radio broadcasts as a means to engage learners in active learning, allowing them to apply knowledge and skills in a real-world context. Through this experiential learning approach, learners better foster important skills such as problem-solving, teamwork, and communication, which are highly valued by employers.

**Keywords:** Experiential learning, outcome-based learning, hands-on experience, analog communication

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### **1. Introduction**

Experiential learning is a powerful educational approach that emphasizes hands-on experience and active engagement in the learning process. It allows learners to acquire new knowledge and skills through direct experience, reflection, and conceptualization. One of the key features of experiential learning is the ability to experiment with new ideas and receive feedback in a safe environment. In this paper, we will explore the benefits of experiential learning in the context of experimenting with new ideas and receiving feedback. (John Dewey, 1986). Experiential learning has several benefits that make it an effective method of learning. First, it provides learners with a safe environment in which to experiment with new ideas. Learners are encouraged to try new things and take risks without fear of failure. This promotes creativity and innovation and allows learners to develop new skills and knowledge. (Akhtar N. and Hussain N., 2019). Second, experiential learning emphasizes reflection and feedback studied by Learners are encouraged to reflect on their experiences and receive feedback from their peers and instructors. This helps learners understand their strengths and weaknesses and identify improvement areas. It also allows learners to receive constructive criticism in a supportive

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Moreover, experiential learning promotes active engagement in the learning process. Learners are encouraged to take ownership of their learning and engage in meaningful and relevant activities to their interests and goals. This helps learners to develop a sense of purpose and motivation, which can lead to better outcomes in the long term

Receiving feedback is also an important aspect of experiential learning. Learners can receive feedback from their peers and instructors, which can help them understand their strengths and weaknesses and identify areas for improvement. This feedback is constructive and supportive and is intended to help learners grow and develop their skills and knowledge

In this paper, we implemented the idea of experiential learning with 2<sup>nd</sup> year UG students in which design and hardware implementation of FM radio was done in a safe environment.

## **2. Literature Survey**

Experiential learning is a process where learners acquire knowledge and skills through direct experience, reflection, and conceptualization. It is widely recognized as an effective method of learning, particularly in fields that require hands-on practice.

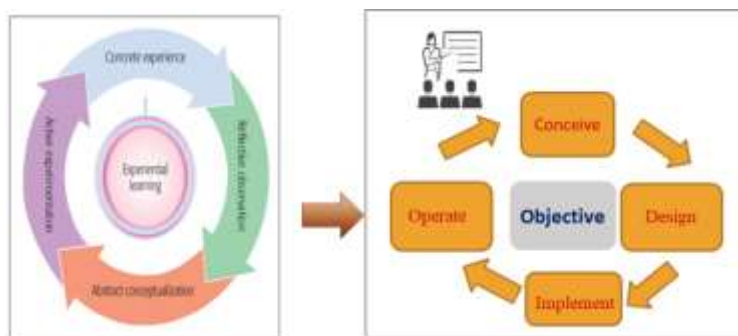
Kolb's Experiential Learning Theory David Kolb, a leading theorist on experiential learning, proposed a learning model based on the cycle of experience, reflection, conceptualization, and experimentation. According to Kolb, learners go through these four stages in the process of acquiring new knowledge and skills. The model has been widely adopted in educational settings and has been applied to fields such as management, medicine, and engineering. (Morris T. H., 2020). Dewey's Theory of Experiential Learning John Dewey, a philosopher and educational reformer, believed that learning occurs through meaningful and relevant experiences. He argued that learners should be actively engaged in the learning process rather than being passive recipients of the information. Dewey's theory has been influential in the development of progressive education, which emphasizes experiential learning as a key component of effective teaching. (Harris, J. 2018). Simulation-based Learning is an experiential learning method that involves creating a simulated environment in which learners can practice skills and techniques. This approach has been used in various fields, including aviation, military training, and healthcare. The use of simulation-based learning has been shown to improve learner outcomes and reduce errors in high-stakes settings. (Campos N. et al. 2020). Service learning is an experiential learning method that combines community service with academic instruction. It allows learners to apply their knowledge and skills in real-world settings while also contributing to their communities. Service learning has been shown to improve learner engagement, academic achievement, and civic responsibility. It has been used in various fields, including education, social work, and environmental studies. (Salam M. et al. 2019). Experiential Learning in Entrepreneurship Education Experiential learning has been widely adopted in entrepreneurship education, which emphasizes the

development of practical skills and knowledge related to starting and managing a business. This approach allows learners to practice the skills and techniques required to be successful in the field. Experiential learning has been shown to improve learner outcomes in entrepreneurship education, including increased confidence, motivation, and success in starting and running a business. (Zeng L. et al. 2023) Thus experiential learning is a powerful method of acquiring knowledge and skills. It has been widely applied in various fields and has been shown to improve learner outcomes. Theoretical models such as Kolb's and Dewey's have provided a framework for understanding the process of experiential learning, while simulation-based learning, service-learning, and entrepreneurship education have demonstrated their practical applications. Further research is needed to explore the effectiveness of experiential learning in other fields and to identify best practices for its implementation

### **3. Experiential learning cycle**

Kurt S. (2020) studied the experiential learning cycle, also known as Kolb's learning cycle shown in Figure (1), as a powerful model that outlines the process of learning through experience. It starts with concrete experiences, where learners engage in real-world activities and encounter new situations. These experiences are followed by reflective observation, where learners reflect on their experiences, thoughts, and feelings. Next, learners move to abstract conceptualization, where they analyze and make meaning of their experiences by forming concepts and theories. Finally, learners engage in active experimentation, where they apply their newly acquired knowledge and skills in real-world situations, leading to new concrete experiences.

**Figure 1: Experiential learning cycle**



This cyclical process allows learners to continually build on their knowledge and skills, promoting deeper understanding and long-term retention of information. The experiential learning cycle is a dynamic and iterative process that encourages active engagement,

reflection, and application, making it an effective approach to learning and development. In our work, we envision an education that stresses the fundamentals set in the context of Conceiving – Designing – Implementing – Operating (CDIO) cycle, which enhances the following features:

- A curriculum organized around mutually supporting disciplines but with CDIO activities highly interwoven
- Rich with student design-build projects
- Featuring active and experiential learning

### **3.1 Design of Experiential Learning for Electronics and communication students**

The design of experiential learning for Electronics and Communication students is a crucial aspect of their education, as it aims to provide them with hands-on, practical experiences that complement their theoretical knowledge. This can be achieved through various methods, such as laboratory experiments, project-based learning, internships, and industry collaborations.

This paper presents a case study on “Design and hardware implementation of FM radio,” project-based learning. It allows students to work on a project requiring problem-solving, critical thinking, and teamwork skills, allowing them to develop practical skills relevant to their field of analog communication. The design of this activity of experiential learning for Electronics and Communication students has been carefully crafted to align with their learning goals, provide opportunities for hands-on application of theoretical concepts, and foster a deep understanding of FM radios in a safe environment. The prime objective of this activity is to teach students to be comfortable on-air piloting a radio show, to work with various electronic components, and to learn the rules and regulations of public radio. The prime learning outcomes for the students are

1. Exhibit the skills of a radio production facility engineer.
2. Perform all aspects of assembly, tuning, and testing of the FM Radio Transmitter
3. Understand the importance of noise considerations in communication systems.
4. Understand the importance of engineering design with respect to the following:
  - Specifications and shape of various components.
  - Design consideration of air core inductor.
  - Tuning of LC circuit for final FM Transmission.
  - Testing of FM radio on spectrum analyzer

The activity was completed in two phases. “Activity Planning phase” and “Activity-Implementation phase.”

- **Phase I: Activity Planning.**

Activity planning is a critical aspect of the experiential learning process, involving carefully designing and organizing activities to promote effective learning outcomes. It entails selecting appropriate activities that align with the learning objectives, considering the needs and abilities of the learners, and creating a structured plan for implementation. Activity planning involves determining the resources, materials, and logistics required for the activities and establishing clear instructions and guidelines for learners to follow. It also includes considering safety measures, timeframes, and sequencing of activities to ensure a smooth and coherent learning experience. Well-designed activity planning enables learners to engage in meaningful experiences actively, promotes motivation, and facilitates the development of key skills and knowledge. It is a crucial step in the experiential learning process that ensures learners have a purposeful and organized framework to engage in hands-on activities that lead to optimal learning outcomes. Table 1 shows the detailed components of the activity planning phase.

**Table 1: Activity planning phase**

<b>Action</b>	<b>Action measure</b>	<b>Leadership style</b>	<b>Communication methods</b>
Purchasing of equipment/ required material for ELC	Equipment and other materials (PCB, components) purchased	n/a	Indents
Training to support staff and teaching assistants.	Imparted Training to TA and staff.	Coaching	In hand training
Devise further challenges for the excellent training	Various challenges for various activities published	Visionary	Team meeting
Preparing a webpage to convey pre-requisite information to students	Webpage created and information (Video, PPT, group information, pre-survey) updated	n/a	ELC web page

Getting ready for the day	Working bench for students and test bench for final testing has been set up	Affiliative	n/a
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- **Phase II: Activity Implementation**

Activity implementation is a pivotal stage in the experiential learning process, where learners actively participate in planned activities to gain first-hand experience and apply their knowledge and skills in real-world situations. During this phase, learners engage in hands-on experiences, interact with their environment, and actively explore and experiment. They are encouraged to take risks, make decisions, and learn from their actions. Activity implementation provides opportunities for learners to practice and refine their skills, receive feedback, and reflect on their experiences. It fosters active engagement, critical thinking, and problem-solving, allowing learners to understand the subject matter better. Effective activity implementation also encourages collaboration and communication, as learners work together and share ideas and perspectives. It is a dynamic and interactive phase that enables learners to actively construct their own learning and make meaningful connections between theory and practice. Table 2 presents the components of the implementation phase.

**Table 2: Activity implementation phase**

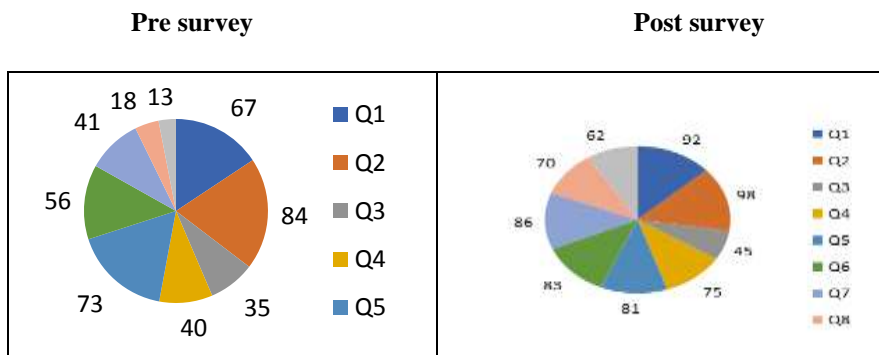
Action	Action measure	Leadership style	Communication methods
The first activity is to complete the PRE survey	Online survey completed	commanding	Online survey
Complete the challenges (Quick wins)	challenges tested on the test bench	n/a	Technician appointed on test bed
Interaction with students to learn about their experience	Communicated with students	coaching	One-to-one correspondence
Post survey	Online survey completed	n/a	Online survey

Recognize participants by giving merit and participation certificates	Certificates given	n/a	--
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• **Pre/Post Survey**

For this activity, a quantitative research design was employed to examine the effects on students' attitudes and learning experiences. A quantitative approach was deemed appropriate for investigating factors that may influence outcomes (Fiet J. O. 2001). A questionnaire was developed, and a pre and post-survey were conducted on the undergraduate Electronics and communication second-year students. The core section of the questionnaire was focused on gathering information about students' perceptions of their learning experience. Experiential learning (EL) indicators included attitude, student involvement, learning expectancy, and learning quality. Figure (2) clearly indicates the improvement in performance.

**Figure 2: PI- chart comparison of pre/post survey**



**Conclusion**

Experiential learning is a powerful method of learning that emphasizes hands-on experience, reflection, and feedback. It provides learners with a safe environment in which to experiment with new ideas and receive feedback, which can lead to breakthrough ideas and innovative solutions. Experiential learning is particularly effective in experimenting

with new ideas and receiving feedback, as it promotes creativity and innovation while supporting learners in their growth and development.

## **References**

- Dewey, J. (1986). Experience and education. In *The educational forum Taylor & Francis Group*, 50 (3), 241-252.
- Akhtar, N, Hussain, N. (2019). Testing ERE Cycle in Teaching Business Communication Courses: Experiential Learning Strategies. *Journal of Education and Educational Development*, 6(1), 62-77.
- Akhtar, R. N. (2020). Exploring Experiential Learning Models and developing an EL based ERE cycle in teaching at higher education in Pakistan. *International Journal of Experiential Learning & Case Studies*, 5(2).
- Morris, T. H. (2020). Experiential learning—a systematic review and revision of Kolb’s model. *Interactive Learning Environments*, 28(8), 1064-1077.
- Harris, J. (2018). Experiential Learning in Circles of Safety: Reflections on Walls to Bridges and Dewey’s Theory of Experience. *Engaged Scholar Journal: Community-Engaged Research, Teaching, and Learning*, 4(1), 197-211.
- Campos, N., Nogal, M., Caliz, C., & Juan, A. A. (2020). Simulation-based education involving online and on-campus models in different European universities. *International journal of educational technology in higher education*, 17, 1-15.
- Salam, M., Awang Iskandar, D. N., Ibrahim, D. H. A., & Farooq, M. S. (2019). Service learning in higher education: A systematic literature review. *Asia Pacific Education Review*, 20, 573-593.
- Zeng, L., Ye, J. H., Wang, N., Lee, Y. S., & Yuan, J. (2023). The Learning Needs of Art and Design Students in Chinese Vocational Colleges for Entrepreneurship Education. *Perspectives of Theory of Entrepreneurial Thought and Action. Sustainability*, 15(3), 2366.
- Kurt, S. (2020). Kolb’s experiential learning theory & learning styles. *Educational Technology*. <https://educationaltechnology.net/kolbs-experiential-learning-theory-learning-styles>.
- Fiet, J. O. (2001). The pedagogical side of entrepreneurship theory. *Journal of Business Venturing*, 16(2), 101-117