

PERCEPTIONS OF SCIENCE TEACHERS ON EXPERIENTIAL LEARNING

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Education system needs to provide students with experiences of positive emotions, pedagogy that draws from each one's personal experiences, and mobilise this knowledge and their personal skills to perform on assigned tasks or solve problems of the real-world. To achieve these aims, the ancient Indian system utilised the concept of *Panchakosha vikas* where learning has been considered a spiritual process under the supervision of gurus. These systems expected the learners to explore, experience, verify and learn things. National Consultative Meets were organised to gather field experiences from science teachers/practitioners of government schools from 25 states/UTs. Most of the science teachers viewed that experiences can be considered as a synonym for learning like the theory suggests but they also felt that it is important to know whose experience is it — the teachers or students? However, the strong perception was that experience guarantees learning and the process of experiential learning is most suitable for lower grades as children who are yet not introduced to the formal techniques and methods learn best through experience.

Introduction

One of the major goals of education is to make learning a meaningful and enjoyable experience for the learners. Several theoretical perspectives on learning have emphasised that it is only possible when the learning process involves learners' experiences, ideas, active participation, reflections and internalisation to the extent that they are able to apply in their daily lives. It is in this context that experiential learning has been considered across the globe as one of the most effective pedagogical approaches. Experiential learning includes any pedagogical process that provides an opportunity for the learners to explore, experience, reflect and apply the learned concepts — be it art integration, storytelling, inquiry-based, etc.

Experiential learning is a process that allows learners to transform and create knowledge, skills, attitudes and ways of thinking through action-reflection and experience-abstraction. Thus, accommodating various learning styles of individual learners by integrating experience, perception, cognition and behaviour. (Lewis and Williams, 1994; Kolb, 2014). Chapman, *et.al.* (1995) stressed on the note that participation in the learning experiences designed does not make it experiential learning. One has to follow all the principles as all of them are equally important. Further, they enlisted the characteristic features that define an activity or method experiential, they include:

1. The activity needs to have a balance in terms of content or concept and the process. Many times, the process overtakes the concepts.

2. Activity should allow the students to take up the process of self-discovery, in other words, allow students to explore and experience.
3. Activities need to be relevant to the students and also, must allow the students to connect the learning to the real world. So, they need to be designed in such a way that students connect the dots to realise the goals.
4. Activities to be designed with scope for reflection of learning to bring theory to life.
5. Activities are to be developed in such a way that they feel and emotionally connect, and not just do it in order to make them understand the process.
6. Provide space for exploring, analysing and altering their own values during the process.
7. Students to be accountable for their actions and own the consequences during the activities.

Experiential learning has been broadly divided into two major categories, i.e., learning through, i. experiences that are field-based and ii. those that are classroom-based. The former includes field trips, projects, surveys, case studies, sports integrated learning, experiments and later includes art-integrated learning, toy-based learning, storytelling, enquiry-based learning, creative writing, technology, enabled learning and discussion.

Experiential Learning in the Ancient Education System of India

Learning in ancient India has been viewed as a holistic process which culminates in the students realising themselves in the

process of knowing and understanding the physical world. To achieve these aims, the system utilised the concept of *Panchakosha vikas* where learning has been considered a spiritual process under the supervision of gurus. The learners were expected to explore, experience, verify and learn things. In other words, they experience true knowledge (*Prama*) of the object (*Prameya*) through *Pramana* (means of knowledge or the source of knowledge). There were two philosophical ways to validate, i.e., direct and indirect. Here direct means the knowledge that can be perceived through the senses, i.e., *Pratyaksha*. Indirect means knowledge that is not taken directly through senses like *anumāna*, *upamāna*, etc. The significant *pramanas* are:

1. *Pratyaksha* (direct perception through sense organs)
2. *Anumana* (inference or syllogistic argument)
3. *Upamana* (analogy)
4. *Sabda* (verbal testimony)
5. *Anupalabdhi* (non-perception)
6. *Arthapatti* (implication)

Utilising the *Prama*, *Prameya* and *Pramana* for acquiring knowledge not only makes Indian education unique in transforming the individual in terms of knowledge, capacities, skills and dispositions but also taking them towards the righteous path in life. Learning was not limited to knowing and recalling accurately but also practising side-by-side in the everyday life.

Experiential learning is emphasised for a holistic and all-round development of children. It also has a lot of scope for

integrating other subjects and disciplines. In other words, knowledge is acquired not in silos but in an integrated manner. Assessment can be carried throughout the process of learning. This approach has strongly been recommended in ancient times and in the modern context as well.

Modern Education and Experiential Learning

Experiential learning is not a new idea in the field of the Indian education system. Sri Aurobindo, Rabindranath Tagore, Mahatma Gandhi, Jiddu Krishnamurthy, Zakir Hussain and Swami Vivekananda have focused on learning as a holistic experience that interacts with one's environment.

Various philosophers like Aristotle and Plato, and psychologists like Kurt Lewin, John Dewey, Jean Piaget and David A. Kolb have been deliberating on the idea of learning in which they discovered experience as an important aspect of learning. Kolb has described how learners' experiences could be transformed into learning through deliberate efforts planned and executed by the teachers/educators.

Kolb (1984) most recently conceptualised it as a process engaging learners in an '*iterative cycle*' based on reflection, theory creation and knowledge application (experimentation) as a result of exposure to concrete experience. Originally, his approach comprised of four stages, i. experience, ii. reflective observation, iii. abstract conceptualisation and iv. active exploration. These can be understood as a recursive cycle in which "a learner connects all these four stages' experiencing, reflecting, thinking and acting — in a recursive process there is sensitivity to the learning situation and what is being learned" (Kolb & Kolb, 2012, p. 1216).

Dewey, in *Experience and Education* (1938), said that "learning from experience involves observation of an event, recollecting previous similar experiences and judgement about the significance of the experience". It is also pertinent to note here Dewey's differentiated between 'activity and intelligent activity' where the latter is characterised by a postponement of action until observation and judgment have occurred" (Roberts, 2006, p. 19).

Kurt Lewin's contribution to experiential learning theory is his action research on the role of feedback in group dynamics (T-groups) in American social psychology and the subsequent influence on the field of organisational behaviour (Kolb, 1984). Piaget's, as a cognitive-developmental psychologist, contribution to experiential learning understanding is his belief that children reorganise through the process of assimilation and accommodation in order to make sense of their world. Experiential learning's affective elements are also attributed to the theorists, such as Carl Rogers and Abraham Maslow. For example, Rogers in '*Freedom to Learn*' (1969), focused on the personal involvement of the learner and the self-initiated desire to comprehend and make meaning of experiences, both from a cognitive and affective perspective.

However, Kolb consistently highlighted the impact of social psychology, philosophy and cognitive psychology to experiential learning theory. Commonality between, Dewey, Piaget and Lewin in their views that learning is cyclical. However, they differ in the expressions of the learning cycle, while they agree on the two basic tenets that "learning takes place as an individual change thinking based on an experience and most importantly, by reflecting on that experience. Learners

revisit that thinking when they explore new contexts, adjusting their thinking as a result of their new experiences". (Menaker, Coleman, Collins, & Murawski, 2006, p. 2).

Several stage models of experiential learning have been proposed, ranging from one-stage to six-stage models (Priest, 1990). The most well-known of David Kolb's ideas is his thought that experience as the source of learning and development (1984). He contends that knowledge is the product of grasping experience and then altering that experience. The Experiential Learning Theory (ELT) model depicts two dialectically related modes of grasping experience — concrete experience and abstract conceptualisation — and two dialectically related modes of transforming experience - reflective observation and active experimentation. The entry point for learning is a concrete experience that is followed by reflection and the formation of abstract conceptions.

Experiential learning, according to Kolb and Kolb (2017), is distinguished by a distinct dynamic between instructors, students and the topic being studied. As a result, teachers and students can learn about the subject directly. It is passed on to them but they are also responsible for generating it. Kolb (2014), defines learning through and from experience as a process that includes (1) engaging in individual experiences (2) observing and reflecting (3) building knowledge and testing concepts in new contexts and (4) applying and testing concepts (Kolb, 2014). A five-step experiential learning process comprising: (i). setting up an experiential situation, (ii). sharing it with others, (iii). putting it into practice, (iv). generalising it and finally, (v). applying it. Here, experiential learning encourages student skill development and

knowledge application (Davidovitch *et al.*, 2014).

Data Collection

Qualitative data was collected through focused group discussions of 50 government school science teachers. Group discussions were held in small groups of teachers to understand the process, challenges in practicing experiential learning in their schools. Efforts were also made to derive suggestions for effective implementation of the approach. Most of the teachers spoke about their classroom discourses where they used experiential learning and challenges perceived by them in doing so. Narratives were collated and analysed to draw conclusions.

The data was collected and collated. The narratives of teachers were read to identify the patterns in thinking and ideas related to their perceptions, understanding and opinions regarding experiential learning. Codes were assigned and broad themes were drawn from the categories. The themes identified were analysed to see interconnections and interpretations were drawn. The themes are as below:

1. Experience can be considered as a synonym for learning.
2. Whose experience also matters — teacher or student?
3. Experience guarantees learning.
4. Experiential learning is most suitable for lower classes.
5. It is the same as having projects or merely, doing an activity.

6. Assessment is generally after completion of the activity or task.
7. We need to reteach the topics again after the experiential learning.

The analysis of the above themes revealed or highlighted the teachers' perception of experiential learning and its practise or execution in the school. The teachers viewed that experiences can be considered as a synonym for learning like the theory suggests but they also felt that, it is important to know whose experience is it — the teacher or student? However, the strong perception was that experience guarantees learning and the process of experiential learning is most suitable for lower grades as children, who are yet not introduced to the formal techniques and methods, learn best through experience. What is more is that they see the world as a whole and therefore, are able to integrate learning through experiences. The challenge, however, was in their perception that it is the same as having projects or merely, doing an activity and that assessment is generally after completion of the activity or task. And these misunderstanding and erroneous practices reflected in their having to reteach the topics again after the experiential learning.

Based on these perceptions, the group discussions focusing on generating suggestions for better implementation of experiential learning, the teachers made the following suggestions on each of the themes, the broad points derived are as follows:

1. **Experience can be considered as a synonym for learning** — The teachers reported that all experiences may or may not lead to learning. What is considered a 'significant

experience' under experiential learning is our deliberate reflection on such experiences and the active participation of students in those experiences. Teachers should structure those experiences so that learners actively participate in the activity, make decisions and find their results.

2. **Whose experience also matters - teacher or student** — While planning any experiential learning-oriented activity, teachers should remember that talking about their own experiences in the classroom will not be counted as a 'significant experience' until the experiences are part of students' lives. Such activity may not be relevant for the students as it may have only the teacher's perspective.
3. **Experience guarantees learning** — In experiential learning, it's the student's experiences that should be given prime importance. There is no guarantee that experiencing always leads to learning. It is important that after identifying the significant experiences, another important step for experiential learning is identifying the source of gaining that experience. However, it is not sufficient to just interact with the experience. To transform that experience into knowledge generation, interpreting that experience, reflecting on it, making conclusions and applying it to different situations is very important. This whole process helps transform experience into a learning process.
4. **Experiential learning is most suitable for lower classes** — Irrespective of

the age or stage of education, all of us learn effectively, and the knowledge gained is retained for a longer duration. Added to this as the children grow, their cognitive processes and social skills need to be strengthened. One of the misconceptions the teachers carry is that experiential learning is relevant only for the early years of learning and is not at all valid.

Of course, the benefits of experiential learning are maximised when students are exposed to it early on as they build a more holistic relationship with learning, right from the beginning. However, the fundamentals of this approach remain as relevant for middle and high schoolers as they are for primary school students. There is a progression in the nature and complexity of problems that students address and the theoretical concepts and skill sets required to come up with solutions to the problems, as students move from lower to higher grades.

Building experiential learning units that engage and motivate the child acquire and apply content knowledge and use problem-solving, critical thinking and collaboration skills requires facilitator expertise across domains and the ability to think laterally.

5. **It is the same as having projects or merely doing an activity —**

Experiential learning is a process, whereby knowledge is created through the transformation of experience and includes four stages: concrete experience, observation, thinking and conceptualisation and active

experimentation. Activity or gaining experience in experiential learning is the first step in the process. They reflect on their learning which is a critical part of the experiential learning cycle that differentiates it from just doing an activity or experiment and leaving it at that.

6. **It is a time-consuming process and it is not possible to complete the syllabus in the stipulated time —** Any child-centric and learning-centred process requires adequate time to engage the learners meaningfully in the process. Hence, the teachers wherever require more time, may club periods of class and also take up team teaching involving subject-specific teachers, and also art education and physical education teachers.

All the teachers of a school must sit and plan an annual plan, including some block hours for experiential learning, where concepts that fall together from different subjects may be pooled up and plan block hours to teach through experiential learning. This would not only bring in a multidisciplinary approach but also make the teaching-learning process very effective. The discussion may also include sharing of common topics, such as environment, resources, water and minerals through team teaching or a single teaching, covering them in an integrated manner. Thus, identification of the areas/topics that can be taught with an experiential approach with the help of other teachers and including them in the annual plan facilitates the process for the whole year.

7. **Content competencies will not be developed—** Many believe that the experiential learning pedagogy takes away the child from textbooks and also from the core abilities to read and write or use books. It helps students read with purpose and with meaning and write with a voice. It believes in activating all the senses that humans have been gifted with to perceive the world and involving the hands, heart and head in the process of learning. As a pedagogy, it discourages over-dependence on one textbook for gaining knowledge about a subject as that has the risk of students developing a narrow and restricted worldview. For experiential learning to be effective, teachers plan literacy-rich projects, case studies and learning expeditions around compelling topics.

The idea is to encourage them to use multiple sources and be able to critique them and arrive at their perspective or understanding rather than passive consumption of content. This will be a critical skill as loads of information served to us is increasingly laden with agendas and is a medium of propaganda serving larger purposes and our students have to be trained to reach out to multiple sources, and question and analyse them rather than blindly accept one text as the final truth.

8. **Assessment is generally after completion of the activity or task—** Assessment is built into every stage of experiential learning. It is through self-assessment, peer assessment and teacher assessment. As we are

talking about the transformation of the experience, the students are assessed while doing the activities or experiencing, reflecting, conceptualising and applying what they have learned. Further assessment includes assessment of processes, attitudes and skill sets along with the concepts. They learn from the experts in real life and apply the skills learned in finding a solution for a real problem.

9. **It is difficult in our Indian classrooms and would not help in exam preparation —** Parents frequently express concerns about whether students from experiential learning systems will be able to handle the rigours of preparing for high-stakes tests and entrance exams in India.

Students who have been taught through experiential learning approaches have been proven to have a considerably deeper and clearer knowledge of subjects, as well as greater skills to acquire what they need to learn and express themselves. All of this puts students at an advantage in any type of examination situation, whether it's a high-stakes board exam or an admission exam. Students from an experience system take less time and effort to transition from a traditional system to an application-oriented one, which is required by most entrance tests because they are already taught to apply what they learn. It is evident that experiential learning not only helps the students learn the concepts better but also enhances their higher-order thinking skills and focuses on the application of concepts attained.

10. We need to reteach the topics again after the experiential learning —

The science teachers felt that in spite of applying experiential learning approach, the students conceptual clarity was compromised and as a result, they had to reteach the topic which added to the quantum of work.

To sum up, the insights gained by the experiences shared by the science teachers during the discussions are summarised below:

- Teachers' perception of experiential learning is not proper, incomplete and limited to conducting activities. Most teachers were considering demonstrations, field visits and movie screenings in isolation as illustrations of experiential learning.
- Teachers' focus was bent towards achieving learning outcomes and not much on the process of learning while designing experiences.
- The most essential component of experiential learning which makes it very significant is reflection. There were hardly any teachers' focus on the students' reflections after they gained experiences during the teaching-learning process.
- Assessment was not an integral part of the experiential learning process in most of the teachers' reflections. In some cases where assessment was part of the process, it was seen that the questions asked were only focusing on the 'what' aspect of the concepts taught rather than the process of learning.

Self - and peer assessment are still not being used properly in the classrooms. Further, there was no provision for applying what they had learned after the conceptualisation.

- Questions are to be asked not only to check the understanding but also to reflect the process of learning. The teacher has to be non-directive, non-judgmental and a facilitator. As the learning process is cyclical in nature and the learner may enter at any stage of experiential learning; assessment needs to be at every stage, and continuous and comprehensive in nature.
- The teachers shared the challenges that they have faced during the conduction of activities in the classrooms. Some of them included overcrowded classrooms, lack of infrastructure and resources, inadequate facilities, absenteeism of students, completion of syllabus, increased focus on examinations, mismatch of the teaching-learning and examinations, time management, power structures in school and class, social acceptance, etc.

Conclusion

The term 'Experiential Learning' is not new, it has been practised in Indian culture and also in the west. However, its implementation is challenging till the point that the system is not made ready to receive it. If once appropriately executed on the field, this pedagogical perspective of teaching and learning practice will facilitate the students to use the

information stored in the brain from their own life experiences at the appropriate time and also applied appropriately in situations to solve problems they face in their daily life. In other words, their thinking and skills transfer

are promoted through experiential learning. What's more is that integration of knowledge and its application to life will effectively happen which is the true meaning of being educated.

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