Teaching learning methodologies and Curriculum Innovation Techniques

Dr G Venkata Rao, Professor, Department of Civil Engineering, Anurag University, Hyderabad

Dr. Eswara Veera Raghava, Department of Civil Engineering Lords Institute of Engineering & Technology

Mr. Shiva Kumar Vignan's Institute of Information Technology, Visakhapatnam

Abstract— Traditional education is the study of culture, traditions, and duties, while modern education teaches students to improvement their skills. In traditional education methods, students learn through memorization skills, while in modern education systems, students learn complete human-environment collaboration. Teaching means to communicate someone while guiding. In teaching learning process, a student, a teacher, and a course involved, for this reason, teaching has been considered as a tripolar process. In this process the student learns new knowledge, behaviors, and skills. In this regard the teacher should appropriate teaching methods based on the type of course that are to create interest to students to learn new things. At present many teaching learning processes are followed that are Experiential learning, Blended learning, Game-based learning, Student-centred learning, Project-based learning etc. In this paper discussing about Experiential learning and Project-based learning and required skill sets to student for industry ready.

Keywords—**Experiential learning, Project-based learning, site visits, Model making, Industry ready**

I. INTRODUCTION

The role of teaching and learning is critical in inspiring teenagers to progress into better members of society since they will eventually take on leadership roles. The teaching-learning process is a means of communication through which a person attempts to develop the routines, abilities, material, attitudes, values, and appreciation necessary to succeed in the information age. Hence, the teaching-learning process turns into a method for producing behavioral changes through practice [1]. The teaching-learning process is a bond between teachers and students where knowledge in a certain area is communicated among student and teacher. It is a combined process where an teacher evaluates learning needs, creates exact learning objectives, and add-ons new learning and teaching strategies [7]. The teaching-learning process agrees teachers to organize and progress their instructional skills and techniques to make teaching more active

2 METHODS

Two different approaches to teaching

2.1 Teacher-centered approach

In this method the teacher to take the authority to passing the information over proper instructions. This type of instructions given by teacher is considered as teacher-centered approach to teaching and this type of teaching is treated as traditional teaching. it is not essentially constantly the most effective.

2.2 Student-centered approach

In student-centered approach the teacher walks into a class instated of giving lecture and checks the student's learning ability. This is an example of a student-centered approach to teaching [2]. This method offers space for building trust and fostering networks with students. Finding a equilibrium between the teacher-centered approach's structure and the student-centered approach's flexibility is ideal. This is not a one-size-fits-all undertaking and, most possible, will vary with each new group of students or cohort.

3 LIST OF DIFFERENT TYPES OF TEACHING STYLES

Lecturer is a traditional teacher-centered approach of one side transformation from teacher to students. Also referred to as an confident style. Lecturing is perfect for large groups of students, like a college lecture course.

Demonstrator method is teacher-centered but more exposed to student involvement. The teacher is even the formal authority giving the material but might ask engaging questions to start a discussion. And they force go beyond lectures to include exercises, presentations, and other visuals.

Hybrid offers a balance between student-centered and teacher-centered approaches. In this method of teaching the teacher provides structure and flexibility, adapting a lesson plan to activities that keep students engaged. While there is advanced student meeting, learning may take place at a slower pace.

Facilitator is a student-centered approach, in which the teacher moves away from an authoritative role and instead facilitates discussions. Students are free to share their knowledge and use their problem-solving skills through inquiry-based learning. While ideal for real-world applications, this approach force not work as well for theory or information-specific classes.

Delegator method is the maximum student-centric approach. Also referred to as a group style, the teacher sees students in peer-to-peer discussions and collaborations.

4 EFFECTIVE TEACHING METHODS

As explored in recent World Teachers Day blog post, teachers are a totally important part of our society, but teaching can be a problematic and stressful job at times. Mostly when working with children and teenagers, it can be hard to retain focus, succeed behavior, and encourage active participation [6]. In this situation the following methods of teaching have applied to students

Experiential learning and Project-based learning.

Learning by experience, it is also known as experiential learning or experienced-based learning, means learning knowledge and skills through straight practice. This involves individuals reflecting on the experience they have had to identify new skills and industry knowledge that they can use in their professional character. Experiential learning is part of the larger category of active learning, because it directly participates students in the process of their own learning.

In Experiential Learning four elements involved First, the learner must be ready to be actively involved in the experience. Second, the learner must be talented to imitate on the experience. Third, the learner must possess and use analytical skills to conceptualize the experience. Finally, the learner must possess decision making and problem-solving skills in order to use the new ideas gained from the experience. In my teaching style first I allow to student to go to the field and observe the what are the existing structure and real suctions. Then I will give one assignment based on Experienced visits. Now I explained the theory linked with their experience. In this teaching methodology the students learned activity and remember the course content.

After visiting the site, the students Calculated the of Direct Run-off for Rain-fall Excess from the Storm Hydrograph - A case study of venkatapur Lake catchment. Near Anurag University, if area of the basin is 30 sq. km. The detail is shown in table1.

Table 1. Details of direct run off ordinates and hydrograph ordinates

Date and Time (1)	Ordinate of hydrograph Total Q (Cumecs) (2)	Base flow (Cumecs) (3)	Direct run-off (Q) (4)
20-08-2016			
0500	14	14	0
0800	25	12	13

1100	51	11	40
1400	65	10	55
1700	54	11	43
2000	28	13	15
2300	14	14	0
			∑Q=166

Directly run off $= \dfrac{0.36 (\sum 0) \times t}{A}$ cm $= \dfrac{0.36 \; 166 \; X \; 3}{30}$ = 5.98cm

In regards with the Hydrology and water resources Engineering course the student visited the Konda Pochamma Sagar at Yerravalli, similar way where ever I have taken class must be experienced with the real structure then I will start the theoretical class work. Photos are presented in the figure.1

Fig. 1diffrent components of diversion head works

Project-based learning: Project-based learning also revolves around projects, but it allows students to solve real-world issues and come up with new solutions over a more extended period makes classes more fun and engaging while students learn new content and develop skills like researching, working independently and with others, critical thinking, etc. In this active learning method, faculty work as a guide, and students take charge of their learning journey. Studying this way can lead to better engagement and understanding, spark their creativity and promote lifelong learning. I have used project-based learning by constructing models related to course and it was improved their understanding levels. The related models are shown in figure 2.

Fig.2 Different models prepared by students

Difference Between Experiential Learning and Project-Based Learning

Experiential Learning (EL) and Project-Based Learning (PBL) are two pedagogical methods calculated to deliver students with hands-on, practical learning involvements. Though both approaches emphasis dynamic participation and real-world application, their focuses, methodologies, and learning outcomes are different. Experiential learning highlights the thru experience of the individual learner as the main source of knowledge acquisition. It focuses on the learner's reflection, critical analysis, and synthesis of experiences to derive meaning and comprehension [4].

The project-based learning is a collaborative approach in which students investigate real-world problems or responsibilities and create tangible solutions or products in groups. PBL highlights interdisciplinarity, critical reasoning, and problem-solving abilities. Teachers serve as facilitators, guiding students through the course and serving as necessary. Experiential Learning emphasizes personal experience and reflection.

Student-centred learning

In student-centred learning approaches, students are invigorated to take an active role in the classroom, rather than taking part in more passive activities like listening to a lecture or writing an essay. They will have lots of discussions with their peers and teachers, and they will also be encouraged to ask questions, which is linked to inquiry-based learning.

Some great examples of this kind of approach include students taking part in debates, small group projects, and fun roleplay situations together. As a teacher, it is my work to be an excellent organizer. At the end of a classroom activity, the teacher should wish students to imitate on what they have learnt.

The main differences between project-based learning and inquiry-based learning

Inquiry-based learning is centred around an important question and focuses more on the process of discovery. Problem-based learning contests students to solve real-world problems and develop solutions. Project-based learning is about travelling an reply [5], while inquiry-based learning is about learning an answer.

5 CURRICULUM INNOVATION & DESIGNING AS PER INDUSTRY NEEDS

What do you mean by industry ready?

An industry expects their employees that apart from their decently technical skills, they should know about personal attributes such as team work, communication skills, integrity, reliability, and self-motivation are required to get industry ready [3]. A study shows that 50% of the curriculum that are been taught in universities, by the time students will graduate and the remaining 50 % skill set is to be learned by utilizing and contributing in the list of activities such as team work Self-motivation speech etc. The activates conducted in the college is presented in figure 3.

Fig.2.Team work, knowledge sharing activities

Add-on courses

Add-on courses are certificate courses, that can be pursued along with regular degree programs. These courses' goal to communicate crucial job skills to students and enable them to acquire an additional certificate along with their degree certificates. Add-on courses are designed to extra degree programs with shorter, practical, and industry-focused programs. Students who complete these courses can gain a dual degree on graduating.

Gust lecture

A guest lecture is a speech or presentation given by an expert in a respective field. Guest lecturers are commonly asked by universities to speak about their experiences and their success. The concept of guest lectures is used by universities and colleges to improve students' knowledge and provide them with an interesting way of education and interacting with new people.

Value-added courses

Value-added courses are courses that are designed to provide essential skills to increase the employability quotient and arming the students with essential skills to succeed in life. They are offered by the university

to improve all areas of importance or relevance in a student's UG or PG course. Example: building design soft waters that is CAD, STAAD, GIS etc.

Industrial visits

An industrial visit is a tour to a company that is a part of professional courses such as engineering. The purpose of an industrial visit is to link the theory taught in a classroom and the practical concepts and to establish the career prospects and challenges in the industry. An industrial visit can also benefit the company to establish a bond with the students and recruit them for placement programs. The industrial visits conducted in the deparment is presented in the figure 4.

Fig.4.Industrial visits organized in the department

Conclusion:

To develop the skill set to the student, The Experiential learning is applied on the venkatapur Lake catchment area i.e., is 30 sq. km for the determination of direct run off depth from Storm Hydrograph ordinates, it is concluded that the run off depth is 5.98cm. Apart from the traditional methods, the project-based learning also used in the class that how to understand the turbines and centrifugal pump shaft speed concepts, by preparing rod cutting model as a problem statement. By conducting the Add-on courses, Gust lecture, Value-added courses and Industrial visits will improve the team work, communication skills, integrity, reliability, and self-motivation to get industry ready.

ACKNOWLEDGMENT

REFERENCES

[1] Experiential learning - Wikipedia

[2] Different Types Of Teaching Styles With Examples - Teachable

[3] Technical Skills: Why They are Important for Your Business (learnupon.com)

[4] Difference Between Experiential Learning and Project-Based Learning - Xtra.net

[5] difference between inquiry-based learning and project based learning - Search (bing.com)

[6] https://www.futurelearn.com/info/blog/effective-teaching-methods

[7] https://edutinker.com/glossary/what-is-teaching-learning-process/