Transforming Teaching Practices: The Critical Role of Teaching-Learning Centers in Academic Institutions

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***Abstract*— Teaching-Learning Centers (TLCs) play a crucial role in transforming teaching practices within academic institutions, driving innovation and enhancing educational quality. This paper explores how TLCs serve as catalysts for change by equipping educators with the tools, resources, and support needed to adopt and implement innovative pedagogical strategies. Through professional development programs, collaborative learning opportunities, and the integration of technology, TLCs empower faculty to create more engaging, inclusive, and effective learning environments. The study also examines the positive impact of TLCs on student learning outcomes, highlighting their role in fostering critical thinking, problem-solving which are the key skills necessary for lifelong learning and navigating an increasingly complex world. The findings emphasize that TLCs are vital to the success of academic institutions, helping to cultivate a culture of continuous improvement and excellence in teaching.**

***Keywords*— critical thinking; lifelong learning; problem solving; Teaching-Learning Centers (TLCs); Effective teaching**

ICTIEE* Track*: Entrepreneurship, collaboration and administration

ICTIEE Sub-Track: Role of Teaching and Learning Centres in Transforming Engineering Education

I. INTRODUCTION

Higher education in India is undergoing significant changes driven by a combination of policy reforms, technological advancements, and shifts in societal needs. The NEP 2020 emphasizes a more holistic and multidisciplinary approach to education, with flexible curricula that encourage critical thinking and creativity.

To make sure that graduates possess the skills required for today's workforce, educational institutions are increasingly collaborating with industry partners. Accreditation processes are expected to become more stringent and outcome-based, ensuring that institutions meet high standards of education.

Faculty being the backbone of the education system, their training is crucial to implement policies effectively, deliver high-quality education, and contribute to the overall development of students and institutions. Therefore, enhancing the quality of teachers is essential for achieving long-term and sustainable nation-building (Kim et al., 2019).

By prioritizing faculty development, the NEP aims to empower educators to deliver high-quality education that meets the needs of a rapidly changing world.

In the rapidly evolving landscape of education, the need for continuous innovation and improvement in teaching practices has never been more critical. Teaching-Learning Centers (TLCs) have emerged as pivotal institutions within academic environments, dedicated to fostering excellence in pedagogy and enhancing the overall educational experience. These centers serve as hubs for professional development, offering faculty members the resources, training, and support necessary to refine their teaching methodologies and stay abreast of the latest educational trends.

The role of TLCs extends beyond mere instructional support; they are instrumental in cultivating a culture of continuous learning and improvement among educators. By promoting evidence-based teaching practices, facilitating interdisciplinary collaboration, and encouraging the integration of technology into the classroom, TLCs play a crucial role in transforming traditional educational paradigms. They empower educators to adapt to the diverse needs of students, thereby enhancing student engagement and success.

II. METHODOLOGY

The perception among some faculty has to change that the "chalk and talk" method is sufficient for teaching, particularly in fields like engineering. The repetitive nature of "chalk and

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talk" can stifle both student and faculty creativity. It often fails to inspire innovation or encourage students to think outside the box.

Continuous professional development for faculty is often neglected, leading to stagnation in teaching practices and knowledge. Without regular upskilling, faculty may struggle to keep pace with the rapidly evolving field of engineering.

According to Kautilya, education should aim to cultivate three key outcomes as defining traits in graduates.

□□□□□□ - the idea of education as a means of generating new knowledge

□□ve□ - The wisdom to apply the right knowledge at the right time, in the right place, and for the right purpose, and

□□□□□□□□□□ – The ability to effectively apply knowledge in real-life situations to achieve desired results.

These outcomes are possible only when the Education System is properly balanced with the integration of knowledge and skills in an appropriate manner. In today's education, organization of knowledge content "what to know" has taken over the best of knowledge seeking 'inquiry', i.e., "how to know". The entire Indian Knowledge Tradition has always focused on 'how' rather than 'what'.

While many workshops and conferences emphasize the desired learning outcomes and the types of learning expected from students, there is often less focus on the essential requirements for effective teaching. According to Radhika (2016) many a time the teachers are just ignoring some of the very important qualities, which one should have to effectively transfer the knowledge (subject) to the students. According to Skinner et al (2021), teachers who haven't been trained in diverse teaching strategies might inadvertently create disparities in educational outcomes.

Competency Based Learning (CBL) goes beyond acquiring knowledge; it focuses on cultivating skills that hold enduring value. Critical thinking, problem-solving, and adaptability are essential elements within CBL. Teachers must possess higher order teaching skills to implement the competency-based education.

Teaching and Learning Centre was established in the year 2015. From 2018, a course EECP – Engineering Educators Certificate Program was designed in tune with the IIEECP course that is offered by IUCEE. The EECP course was mandated for all the newly recruited faculty of the institute. Six modules covered various aspects on managing the course content, techniques of effective course delivery, incorporating technology in teaching, designing higher level questions. The faculty were given one semester time to implement the strategies learnt during the course and a capstone presentation was mandated after completion of the semester to reflect on the practices.

III. RESULTS & DISCUSSION

The current paper is on the training program that is conducted by TLC in six modules and its impact in improving the teaching skills of the faculty. There were 130 faculty members participating. They were from different departments and are all newly recruited. A survey was taken for all the faculty who have taken the EECP course to identify the impact of the course in enhancing their skills. A total of 130 faculty responded. The experience of the faculty members ranged between 0 to 21 years.

Below graph gives an idea of the impact and is discussed below.

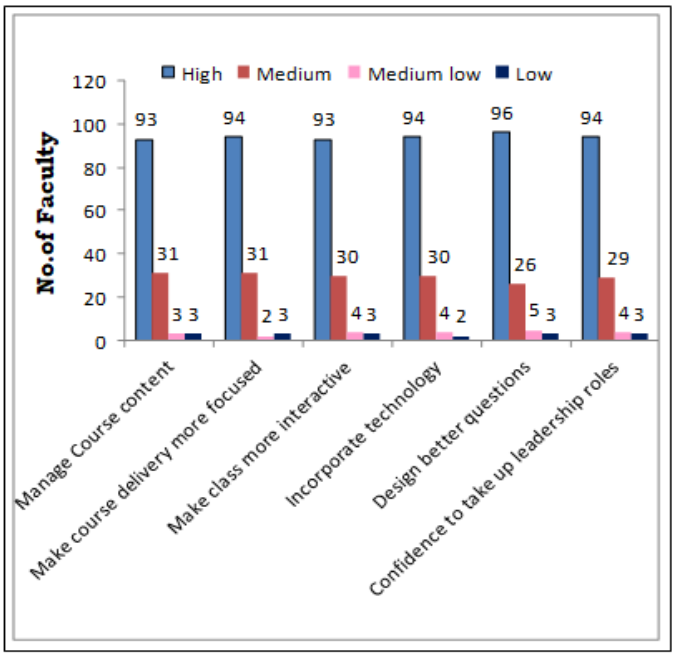

Fig. 1. Impact of EECP course

On a scale of 1-4 (1 being lowest, 4 being highest) six parameters were surveyed. 71.5% of the total respondents have indicated that they are able to manage the course content effectively and 23.8% indicated that they need more improvement. 72.3% have responded that they are able to make more interested and focused delivery of the content. The usage of different teaching techniques was evident from 71.5% of them opting to the highest level and 23% indicated further improvement. In order to enhance the learning experience, usage of technology was focused. 72.3% have responded that they are able to incorporate technology in their teaching. Designing higher level questions being very crucial the survey identified that 75.3% are able to design higher level questions and 20% need improvement. 72.3% responded that there is an overall impact and improvement of the EECP course on the confidence to take up leadership role.

In order to understand the real impact of EECP course the IQAC wing audits the course files for each unit of the course of all the faculty and specific attention is given on

i. CO-PO Mapping with justification
ii. Designing of session planner: the sub sections include
    a. COTs-Concept Oriented Tutorials
    b. Two micro-projects
    c. Video resources for a topic
iii. Designing of questions as per Bloom's Taxonomy

iv. Planning and Implementation of different learning strategies
v. RTA- Real Time Applications

Faculty have to prepare all the above for the course that they are handling in the particular semester. Without concrete evidence of how lessons are enacted in the classroom, it can be difficult to assess the effectiveness of teaching strategies (Diem &Thathong, 2019; Jacobs et al., 2008). Therefore, an audit of the activities carried out in the classroom is performed. Marks were allotted to each of the criteria based on the rubrics designed. Following is the marks distribution for different parameters.

TABLE I
MARKS DISTRIBUTION FOR DIFFERENT PARAMETERS.

Parameter	Marks allotted
CO-PO Mapping with justification	5
Designing of session planner	5
Bloom's Taxonomy level questions	10
Planning & implementation of ALS	10
RTA-Real Time applications	5

A cutoff of 75% and above is considered to understand the impact. The graph gives the statistics.

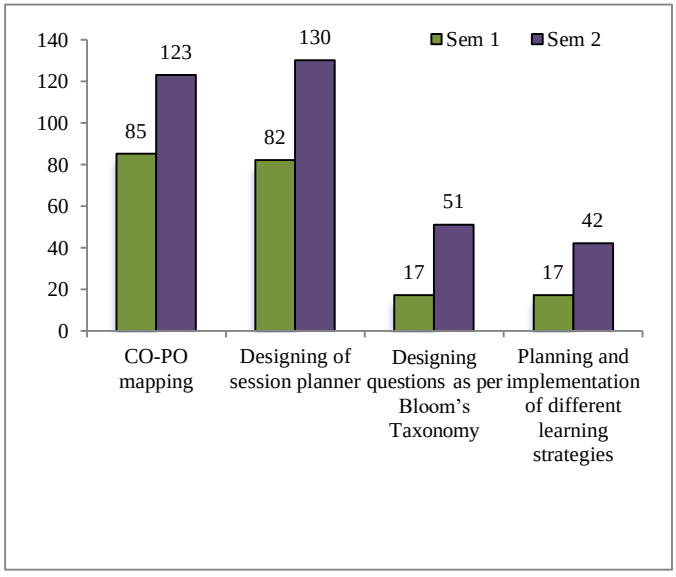

Fig. 2. Audit scores of the four criteria during semester 1 & 2

1) CO-PO mapping

As the CO-PO mapping provides a basis for evaluating the effectiveness of a program, it is important that faculty can clearly define course outcomes and map to program outcomes. Since the mapping process holds educators accountable for delivering a curriculum that meets predefined educational goals, thereby ensuring the quality and integrity of the academic program, the audit is carried out for the CO-PO mapping. It is clear from the graph that in the first semester of their implementation 85 faculty could score more than 75% of marks and the number increased to 123 in the next semester

2) Designing of session planner

Planning is essential for every teacher's professional development (Ruys, van Keer & Aelterman, 2012).A session planner helps educators allocate appropriate time to different activities, ensuring that each segment of the lesson receives the attention it deserves. It was mandated that faculty prepare the session planner including the use of diverse teaching methods (e.g., lectures, discussions, group work, hands-on activities) within a single session, catering to different learning styles and keeping students actively engaged. The audit of the session planner revealed that 82 faculty were able to design effective session planner and in the next semester the count increased to 130 members.

3) Designing questions as per Bloom's Taxonomy

Marlina et al., (2023), pointed out that the integration of high-order thinking skills from pedagogical perspective with full mastery of the subject matter is pivotal in the curriculum. It is noted that when teachers ask higher-order questions and provide students opportunities to analyze, learning is enhanced across content areas. These higher-order questions often start with question stems such as "Why," "What caused," "How did it occur," "What if," "How does it compare," or "What is the evidence". Critical thinking skills which are very important for a 21st century learner can be developed by encouraging students to engage with these types of questions. Teachers need to understand students' higher-order thinking skills (HOTS) to deliver quality instruction in science (Anderson &Krathwohl, 2015). Therefore criteria –iii that focuses on designing questions as per bloom's level is much stressed and more weightage is given in the audit. During the first semester only 17 faculty could design questions at different levels of Bloom's taxonomy. With the intervention of TLC the number increased to 51.

4) Planning and implementation of different learning strategies

To foster positive classroom interactions and achieve high learning standards that support lifelong learning, teachers should provide activities that are logically challenging and intellectually stimulating. (Daflizar, 2023). Traditional teaching methods that are based on a one-size-fits-all approach are not suitable for education today (Bondie et al., 2019). Implementing varied learning strategies, such as group work, discussions, hands-on activities, and multimedia presentations, increases student engagement. Active learning strategies help maintain student interest and motivation by making learning more interactive and enjoyable. The activities that are thoughtfully integrated and reflected in session planner are audited. It is clear from the graph that only 17 faculty members could plan and implement and the number increased to 42 with the intervention of TLC by next semester.

5) Impact on the course outcomes attained

The impact of the implementing different strategies in the classroom by the faculty on course outcomes is studied. For the courses Applied Physics, Linear algebra, English, Engineering Drawing dealt in the first year for two academic years is compared. It is noted that the course attainment values improved in the subjects. The below graph reflects the same.

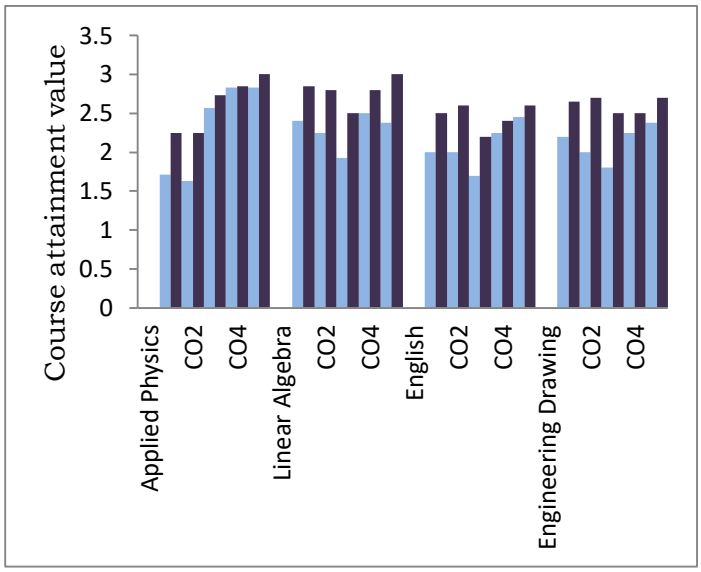

Fig. 3. Improvement in the course attainment

CONCLUSIONS

The impact of the EECP course offered by TLC is evident from the marks scored by the faculty and improvement during the next semester audit.

The findings presented herein underscore the significance of investing in and supporting Teaching-Learning Centers as vital components of any educational institution's mission to deliver high-quality education.

This study explored by examining the strategies employed by TLC and their effects on educational practices. It is evident that the TLC at the institute has empowered educators to refine their teaching methods, adopt innovative strategies, and remain responsive to the evolving needs of their students.

It is also clear that TLC has fostered a culture of continuous improvement in teaching practices through the EECP course and thus encouraging faculty to experiment with and integrate diverse instructional approaches.

It can be concluded that through enhancing teaching strategies, improving learning outcomes, and fostering essential learning skills, these centers contribute significantly to the overall quality and effectiveness of academic programs,

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