

## **The Importance of Ongoing Professional Development for Teachers: Enhancing Pedagogical Practices and Student Outcomes**

**Sundaresan Ranganathan<sup>1</sup> and M. Vetrivel<sup>2</sup>**

<sup>1</sup>*Research Scholar, Department of Commerce, VELS University (VISTAS), Chennai, India.*

<sup>2</sup>*Associate Professor, Department of Commerce, VELS University (VISTAS), Chennai, India.*

[vetrivel.sms@velsuniv.ac.in](mailto:vetrivel.sms@velsuniv.ac.in)

**Abstract:** The ongoing professional development of a teacher is a continuous learning process. Teachers are the backbone of imparting quality education to students and effective professional development is a critical component in improving the quality of education and enhancing student learning outcomes. Drawing upon a thorough examination of the relevant literature, this research study investigates the key elements and characteristics of successful professional development programs designed to support and empower teachers in their pedagogical practices and professional growth. This research study suggests innovative teaching methodologies that can be implemented in the modern education system to minimize interaction gaps between students and teachers while conveniently delivering structured syllabus to achieve optimal results. By implementing these teaching methods, teachers can manage their time effectively without experiencing peer pressure. This theoretical study draws upon three theories such as Self-Directed Learning, Situated Learning and Adult Learning Theory. This study highlights the teacher's individual-level approaches to professional development, emphasizing the transformative potential of providing teachers with avenues for active engagement, collaborative learning and critical reflection.

**Keywords:** *Conceptual Framework, Teacher Professional Development, Pedagogical Practices, Student Outcomes, Individual-Level Approaches*

### **I. INTRODUCTION**

The critical role of ongoing professional development in elevating the quality of instruction and improving student learning outcomes has gained widespread recognition among educators, researchers and policymakers across the education sector. The need for this 21<sup>st</sup>-century educational system might be structured upon the skill demand from the current industry practices and trends. Industries are seeking skilled workforce for their work culture which rapidly creates peer pressure on the students and teachers to maintain their quality of education and make students survive more comfortably in the outside world after their graduation. To effectively foster student skill development, teachers should adapt modern learning methods to develop their student's skills and prepare them well to fulfil the industry needs with their students' acquired knowledge. Therefore, teachers must inculcate modern adaptive teaching-learning methods into the curriculum for their student's welfare and their teaching career advancement.

#### **The Overview of Self-Directed Learning (SDL)**

The self-directed learning pedagogical method focuses on the effective action of planning, executing and evaluating the learning experience by the individual learners with their interests.

The main objective of the SDL is developing student's ability in critical thinking, computational thinking, design thinking and problem-solving skill sets that fall under "*ways of thinking*". SDL method introduces digital and technically advanced tools to keep the learners more connected in their learning phase comes under "*tools of working*". SDL Method of teaching encourages each learner to expand their learning practices beyond the traditional classroom method and prepare themselves to learn their curriculum concepts independently which falls under "*ways of working*". A research study conducted by Karats et al. [1] identified that SDL skills are directly associated with 21<sup>st</sup>-century skills and positively correlated with statistical evidence. The underlying theory of SDL is developed from the active learning theory. According to Michael Price's [2] explanation, "*Active learning is any method that engages students in the learning process*" which furthermore explains the importance of the active learning process among students and encourages and motivates them to identify new ways with curiosity and passion towards reading in the Self-directed learning method.

### **Situated Learning Theory Concept – An Overview**

The previous paradigm of teaching and learning views has been much influenced by the whole new concept of analyzing the teacher's learning outcomes and their behaviour developed by *Lave and Wenger (1991)* [3]. Based on their research, a three-level model for learning is implemented to analyze the inhibition of teachers' behaviours in the classroom and capture their actions using brain research to learn how this model combines the ideas of learning through real-life scenarios with traditional learning theory. Their study broadened the implication of brand-new concepts in teaching and turned impressive interest among teachers, educators and researchers. The best example of the situated learning theory is adapting an e-learning method of teaching practices in today's education for students' self-paced learning and advanced skill development outcomes. The situated learning theory fully supports innovative modern pedagogical practices and student learning outcomes by adapting the e-learning teaching approach.

### **Adult Learning Theory**

According to *Malcolm Knowles (1988)* [4], adult learning varies in different ways, starting from childhood learning practices. He also proposed a term called "*andragogy*" to express the different phases in learning to enhance pedagogy. The principles of andragogy are applied in children's learning for their continuous learning for the life term. Knowles' views and learning models have undergone intense research and the method suggested that adults learn differently from children. The key research difference between adult and children learning is motivated by different aspects of learning. Also, the theory described by Knowles is grouped under six aspects. They are

1. The learners need to know why they want this
2. The learners are responsible for their self-decisions
3. The value and role of the individual learner's experience
4. The learner's readiness for learning
5. The learner's self-motivation
6. The learner's perspective on dealing with the real-time scenarios

To achieve the above student learning outcomes, teachers should adapt themselves to technologically advanced innovative teaching-learning methods such as

- E-learning concept of learning (comprehensive digital learning method for student self-paced teaching)
- Domain-specific method of teaching (specialized teaching method related to the domain-specific industry need)
- Customized learning method (adaptive teaching method for different learning styles to focus on individual student's strengths and weaknesses)
- Cognitive Learning Approach (align teaching method with industry expectation to encourage entrepreneurial skill development among students and encourage project-based learning)

## **II. LITERATURE REVIEW**

Continuous research has demonstrated that teachers' professional development is crucial for improving teaching skills and keeping them abreast of new technological advancements and educational trends, ultimately creating a better learning environment for students, as highlighted by Darling-Hammond et al. (2017) [5]. Teachers play a key role in maintaining high educational standards and encouraging students' continuous educational achievements and skill development. Therefore, it is essential to support their teaching and provide ample opportunities for students' career growth, as noted by Kiran et al. (2022) [6]. Darling-Hammond et al. (2017) cite numerous studies describing various teaching methods and practices, and the researchers emphasize the importance of adapting innovative teaching methods in contemporary education to develop students' critical thinking, problem-solving, computational thinking, design thinking, and communication skills. Addressing the need for new teaching method adaptation requires providing teachers with adequate support. Educational institutions should train teachers on effectively implementing new teaching methods, familiarize them with available innovative methods, and instruct them on using advanced learning tools to cultivate student skills and achieve positive outcomes. This can be accomplished through faculty enrichment programs and Faculty Development Programs (FDPs), along with the creation of professional learning communities (PLCs) specifically designed for teachers' growth and career advancement.

Some studies have shown that providing training to teachers positively impacts teaching performance. However, other research indicates that traditional professional development programs often fail to produce significant long-term changes in teachers' instructional practices and student learning. Consequently, many educational leaders and experts suggest focusing on personalized professional development for teachers, similar to how students are supported, to address each teacher's individual needs and teaching preferences. One effective method for personalized professional development is encouraging collaborative activities among teachers, such as observing each other's teaching styles, team teaching, and participating in professional development communities both within and outside the school. These collaborative activities facilitate peer learning and encourage the application of new teaching strategies in the classroom. A barrier to teachers' professional development is the lack of time for self-learning. To address this, educational institutions can integrate technology-driven professional development, such as e-learning platforms and virtual workshops, providing teachers with flexible learning opportunities that allow them to access resources at their convenience, as suggested by Dede (2006) [7].

Research by Kang and Hsu (2020) [8] has shown that online professional development programs can effectively engage teachers in group discussions, collaborative tasks, and real-time learning of digital tool applications through this interactive approach. Studies highlighting the role of a cognitive learning approach suggest that it increases the likelihood of implementing innovative teaching methods, helping teachers understand and adapt digital tools more easily. Timperley (2011) [9] emphasizes the importance of teachers reflecting on their teaching methods and how their students are developing their skills.

**Research Goal:** This core study examines how continuous professional development (PD) in learning and improvement on teaching methodologies impact both educators and students. It focuses on how professional development-specific approaches influence pedagogical practices, student engagement and learning satisfaction. The ultimate goal is to provide a theoretical and practical foundation for implementing sustainable professional development strategies across educational institutions.

### **Objectives of the Study:**

- To examine modern teaching practices in educational institutions.
- To measure changes in student engagement in pre and post-intervention on modern teaching method into the curriculum.
- To explore the role of PLCs in supporting effective implementation of professional development strategies.

### **III. METHODOLOGY**

The study focuses on a group of 50 participants (25 teachers and 25 students) from institutions in Tamil Nadu. Stratified random sampling was used to include participants with different educational levels, teaching experience and subject areas. This method helped to create a balanced and meaningful group for the study. The data was collected from three main sources such as surveys, feedback forms and classroom observation. Over a six-week intervention, a structured 5-point Likert Scale questionnaire was prepared for both the teachers and students to measure teaching methods and student engagement. Weekly observations were conducted to monitor teaching practices and student interaction levels. The observation was conducted focusing on the application of e-learning tools, domain-specific teaching and customized learning strategies.

**Questionnaire for Students:** The student questionnaire was designed to assess their engagement with modern teaching strategies and the impact of digital tools on their learning experience. Both the questionnaires were based on a 5-point Likert scale for detailed feedback collection.

1. How often do your teachers use digital tools or e-learning methods during the class?  
(a) Never (b) Rarely (c) Sometimes (d) Often (e) Always
2. How engaging do you find yourself when your subject teacher uses new digital or online learning strategies?  
(a) Not engaging (b) Slightly engaging (c) Neutral (d) Engaging (e) Very engaging
3. Do you feel your teacher has improved in explaining subject-specific or domain-specific concepts over the past semester?

- (a) Strongly Disagree (b) Disagree (c) Neutral (d) Agree (e) Strongly Agree
4. Does your teacher offer personalized help or modify lessons to better fit your learning needs?  
(a) Never (b) Rarely (c) Sometimes (d) Often (e) Always
5. How well do you understand your teaching material while studying?  
(a) Not at all (b) Slightly (c) Moderately (d) Very well (e) Extremely well

**Questionnaire for Teachers:** The teacher questionnaire was designed to evaluate the effectiveness of the Faculty Development Programs (FDPs) and how teachers applied post-training modern teaching strategies in their classrooms.

1. How frequently do you use e-learning methods and other modern teaching methods in your teaching after participating in FDPs?  
(a) Never (b) Rarely (c) Sometimes (d) Often (e) Always
2. Has the domain-specific training provided through the FDP helped you to improve your teaching in your subject handling?  
(a) Strongly Disagree (b) Disagree (c) Neutral (d) Agree (e) Strongly Agree
3. Do you feel the personalized professional development opportunities have helped you to address the specific teaching challenges?  
(a) Not at all (b) Slightly (c) Neutral (d) Considerably (e) Greatly
4. How often do you apply innovative teaching methodologies in your lesson planning after attending the FDP?  
(a) Never (b) Rarely (c) Sometimes (d) Often (e) Always
5. How do your Professional Learning Communities (PLC's) help in improving your teaching strategies and technological advancements?  
(a) Not helpful (b) Slightly helpful (c) Neutral (d) Helpful (e) Very helpful

**Framework for Ongoing Professional Development (PD):** The framework identifies key variables influencing the outcomes of professional development initiatives categorized into independent variables (PD approaches), mediating variables (Professional Learning Communities - PLCs) and dependent variables (teaching and learning outcomes).

**(a) Independent Variables (PD Approach):**

The key components of professional development are categorized into four methods, each addressing specific aspects of teaching and learning outcomes.

**E-Learning Concept of Learning:** Training provided in educational institutions through digital platforms tools such as learning management systems, virtual classrooms and online assessments to enhance the teaching-learning process to improve teacher's digital literacy freedom and facilitate them to access the self-paced digital learning environment. **Self-Directed Learning Theory,** emphasizes the learner's autonomy and the actual usage of digital resources for personalized knowledge acquisition.

**Domain-Specific Method of Teaching:** Professional development (PD) that focuses on encouraging subject/domain-specific knowledge and skill development among students (e.g., Engineering, Arts, Sports etc.) to enhance teacher expertise in their respective subjects for promoting in-depth understanding and effective curriculum delivery. *Situated Learning Theory,* assumes that learning is most effective when it occurs within relevant real-world applications.

**Customized Learning Method:** Developing adaptive learning strategies to address students'

learning needs to adapt new teaching practices to analyze diverse students' strengths, weaknesses and learning styles to strengthen student engagement and teacher's continuous learning. *Adult Learning Theory or Andragogy*, highlights the importance of personalized and experience-driven learning practices.

Cognitive Learning Approach: Professional Development focusing on reflective and critical thinking techniques for in-depth understanding and retention of knowledge to enhance the retention and application of knowledge that promotes cognitive development among student and teacher. *Situated Learning Theory* emphasizes the role of context and interaction in the cognitive learning approach.

### **(b) Mediating Variables - Professional Learning Communities (PLCs)**

PLCs act as a bridge between professional development (PD) approaches and their measurable outcomes by nurturing collaboration, peer learning and ongoing professional growth. PLCs are the communities where teachers engage in shared best practices, discussions and feedback exchange to enhance the practical implementation of Professional Development by creating a supportive environment for teachers' continuous learning.

The mechanisms involved are:

1. Regular peer reviews and mentoring sessions.
2. Collaborative lesson planning and co-teaching opportunities.
3. Sharing best practices through institutional platforms.

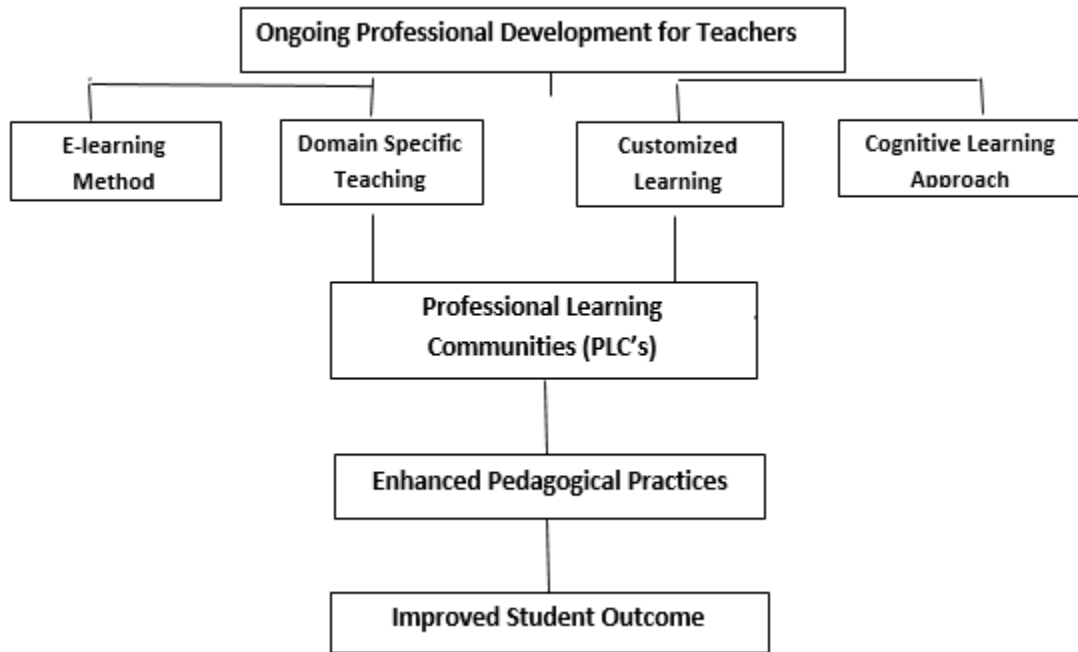
### **(c) Dependent Variables – Research Outcomes**

These are the outcomes of the professional development program conducted for teachers to measure their teaching and students' learning practices.

Enhanced Pedagogical Practices: The adaptation of modern teaching strategies and the effective use of technology and tools in the classroom measured by classroom observations on tool usage, lesson delivery, and student interaction levels. This leads to increased teacher effectiveness and adaptability.

Improved Student Outcomes: A higher level of students' active participation in the classroom and their academic performance measured by analyzing Student pre and post-intervention feedback, grades and assessment data leading to student learning satisfaction and more engagement.

**Conceptual Framework:** The framework integrates the independent, mediating and dependent variables to relate how professional development impacts teaching and learning outcomes.



**Fig. 1:** The pictorial representation of the conceptual framework

### **Context of Ongoing Professional Development**

Ongoing professional development plays a transformative role in adapting and implementing modernized teaching practices to meet current educational demands. E-learning, a key approach, positively impacts teachers by enhancing their technological skills and enabling the effective use of digital tools in the classroom. This integration leads to improved pedagogical practices and creates a dynamic teaching environment. Another essential aspect is domain-specific expert teaching, which fosters more effective subject-specific teaching methods, enhancing both teacher and student engagement with the curriculum and improving academic results. In classrooms with diverse student needs and learning styles, customized pedagogical approaches are crucial. These methods encourage teachers to adapt their teaching styles to address individual students' unique challenges, leading to greater student engagement and more impactful instruction. The cognitive learning approach focuses on developing critical thinking and problem-solving skills, helping students retain knowledge long-term. This method improves the quality of education for both students and teachers through a continuous learning process. In conclusion, professional learning communities (PLCs) bridge the gap between professional development strategies and reflective teaching outcomes by organizing teacher collaboration, peer feedback, and the sharing of best practices within the institution. Regularly conducted PLCs encourage teacher communities to identify gaps in their teaching methods, improve best learning practices, and foster positive student engagement to meet the demanding needs of a modern education system.

### **IV. DATA ANALYSIS AND INTERPRETATION**

The collected survey data were analysed using descriptive statistical methods, including

calculating the mean, frequency, and percentage, to evaluate the effectiveness of the teaching tools used in the classroom and measure their impact. Classroom observations were conducted, and the results were reviewed to gain a clear understanding of the intervention intervals. The gathered data were processed using statistical formulas, and calculations were performed manually to determine the statistical results.

**Descriptive Statistics:**

Mean: The average response obtained from surveys and assessments was calculated using the formula  $\text{Mean } (x) = \sum x / n$

Where, x – is individual data points and n - total number of data points

Percentage Change: The change in student engagement and test results percentage for pre- and post-intervention was calculated using  $\text{Percentage Change} = (\text{Post} - \text{Pre}) \times 100 / \text{Pre}$

Where, Post - Post-intervention value, Pre - Pre-intervention value

Paired t-Test: To measure the effectiveness of new teaching method implementation by comparing pre and post-intervention scores. The t-value was calculated using

$$t = \frac{d}{S_d} \sqrt{n}$$

Where, d = Mean of the differences in paired observations,  $S_d$  = Standard Deviation of the differences and n = number of pairs

Cohen's d (Effect Size): To determine the significant change between pre and post-intervention outcomes, the effect size was calculated using:

$$d = \frac{\text{Mean of Group 1} - \text{Mean of Group 2}}{\text{Pooled Standard Deviation}}$$

Where, Mean of Group 1 = The average score measured after post-training, Mean of Group 2:

The average score measured before pre-training and Pooled Standard Deviation: The combined two group variability was calculated using,

$$\text{Pooled SD} = \sqrt{\frac{SD_1^2 + SD_2^2}{2}}$$

Correlation Coefficient (Pearson's r): To examine the strength and direction of the relationship between teacher engagement in professional development activities and changes in student learning outcomes, the Pearson's correlation coefficient was calculated using:

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

Where,

x and y are the variables,  $\bar{x}$  and  $\bar{y}$  are the means of the x and y variables.

PD Approach	Pre FDP	Post FDP	% of Student Learning Outcome
Usage of E-Learning Methods	2.3	4.1	78%
Student Engagement (survey data)	3.2	4.5	41%
Domain-Specific PD (test results)	60%	75%	25%
Customized learning approach	3.5	4.3	23%
Cognitive Learning Approach	2.8	4.2	50%

**VI. FINDINGS**



**Impact of E-Learning Pedagogical Practices:** The integration of E-learning practices into classroom significantly improved teaching efficiency and student participation. Teachers reported a 78% increase in their knowledge and the ability to use the digital tools in their classroom after participating in the professional development program. The involvement of students is 41% higher engagement in their lessons and active listening after the digital tool implementation into their curriculum practices. The teachers noted that digital tools integration yield more interaction and flexible lesson delivery which aligned well with student's learning preferences.

**Effectiveness of Domain-Specific Teaching:** Teachers specializing in their respective domain-specific subjects (eg. Mech, ECE, EEE) demonstrated a 25% improvement in the delivery of subject content after attending the FDP. This improvement was better matched with current industry standards because of the change in their teaching method. On the other hand, 15% increase in student class test results was observed indicating enhanced understanding and attention to complex concepts. Teachers identified that domain-specific training helped them to connect their curriculum with real-world applications.

**The Role of Customized Learning Approach in Academics:** This Approach Proved to be a highly effective strategy for addressing diverse classroom challenges faced by educators. 23% of teachers reported that tailoring their teaching methods to individual student learning styles improved the classroom environment. Focusing on student's strengths and weaknesses yields a more inclusive and engaging student environment. This approach not only helped students to grasp complex concepts but also helped teachers to refine their teaching techniques. Teachers also noted that this approach created a more focused and productive learning space.

**Influence of Cognitive Learning Approach:** This approach involving learning strategies such as critical thinking exercises, reflective teaching practices and problem-solving exercises had a transformative impact on both teachers and students. Teachers who integrated cognitive learning strategies realized a 50% improvement in student analytical skills and met their industry demands beyond academic performance. Teachers noted that this approach encouraged students to actively participate in the learning processes and apply their knowledge to practical scenarios.

## **VII. DISCUSSION**

The overall findings of the research highlight the significant role of ongoing professional development in improving the pedagogical practices of teaching methods and enhancing student outcomes. This study demonstrates how differently teachers can implement e-learning, domain-specific teaching, customized learning and Cognitive Learning approaches to significantly impact the overall teaching methods and students' learning experiences.

### **Impact of E-Learning Teaching Method:**

The increased usage of digital tools and learning platforms among teachers following their participation in Faculty Development Programs (FDPs) and Professional Development Programs (PLCs) highlights the growing potential of technology in modern education. Teachers reported an increase in their ability to adapt and integrate e-learning tools into the classroom which identifies the increasing importance of digital literacy in today's educational environment. This change reflects the urgent need for educators to adapt to the digital era and is necessary to equip students for a technology-driven world. Through this study, students also reported a higher level of engagement in lessons where digital tools were actively used. The integration of e-learning

methods in their classroom gives space for students to connect more deeply with the curriculum. These study results showcase the relevant principles of Self-Directed Learning Theory, which emphasizes that students benefit from using digital platforms as valuable tools for self-paced learning and staying connected in the digital age. Teachers who are skilled in using these tools can effectively improve their student's learning styles and create a dynamic classroom environment.

### **Effectiveness of Domain-Specific Teaching:**

The domain-specific training sessions offered through the FDP programs showed significant benefits, particularly in subject-based teaching methods. Teachers specializing in STEM (Science, Technology, Engineering and Mathematics) subjects showed improvement in delivering their subject content while students' test result scores improved in these core subjects. This finding supports the principles of Situated Learning Theory, which suggests that learning is more effective when it occurs within a specific context or subject domain. These studies highlight that focusing on domain-specific teaching helps teachers develop in-depth, long-term knowledge promoting continuous professional growth and improvised learning experiences for students. It also enhances students' learning experience by making the content more relevant. The study also highlighted the importance of specialized professional development programs for different subjects to meet the student's specific needs.

### **Role of Customized Learning Approach:**

A personalized professional development case study proved to be one of the most effective strategies to help teachers address their unique teaching challenges in the classroom. The Personalized Learning and Differentiated Instruction approach helped teachers to customize the curriculum to meet their individual needs and goals. By implementing this approach, teachers can improve the quality of teaching methods and create a better learning atmosphere for their students. This customized learning approach will encourage the teacher's community to take ownership of their professional development.

### **The Influence of the Cognitive Learning Approach:**

Teachers who incorporate a knowledge-based teaching approach into classroom discussions have seen significant changes in their student's understanding of concepts and their active participation in the classroom. This finding supports the cognitive load theory. This emphasizes the importance of cognitive learning approaches in helping students retain knowledge and understand complex concepts. Effectiveness of cognitive learning strategies in improving teaching practices and student learning outcomes. It emphasizes the need to regularly practice professional development programs and faculty development programs to focus on improving intellectual learning techniques, the study suggests that conducting regular training will encourage the teaching community to create a more thoughtful and reflective classroom environment. This adaptation will also encourage the student community to effectively develop and use digital skills to learn at their own pace.

### **The Role of PLCs and FDPs among Teachers Community:**

The role of Professional Learning Communities (PLCs) and Faculty Development Training Programs (FDPs) plays a key role in the modern educational system to effectively transfer the skills, resources and knowledge from professional development programs to classroom practices. Teachers who participated in Professional Learning Communities and Faculty Development Training Programs observed higher levels of collaboration among faculty, valuable peer teaching suggestions and opportunities for continuous learning. Developing communities like this inside a campus will serve as knowledge-sharing platforms for sharing individual best practices, addressing real-time challenges and support required from the educational institution which amplifies the benefits of professional development programs. This study highlights the importance of collaborative learning environments where teachers can learn and grow professionally from one another, share resources and continuously develop their teaching strategies. The success of Professional Learning Communities and Faculty Development Training Programs in this study suggests the need for ongoing peer collaboration considered to be a key component of professional development initiatives. These collaborative efforts not only help teachers grow professionally but also improve the overall teaching and learning experience.

### **VIII. CONCLUSION**

This research confirms that ongoing professional development is essential for helping teachers improve their modern teaching methods and student success. The findings show that professional development programs, especially those focused on implementing e-learning, domain-specific teaching, customized learning, and cognitive learning approaches, have a strong positive impact on both teaching effectiveness and student engagement with the curriculum.

E-learning methods help teachers integrate technology and digital tools into the classroom, making lesson planning for each semester more interactive and results-oriented. They also help students become more comfortable with digital tools and advance their technical and industry-ready skills.

Domain-specific training ensures that teachers gain the in-depth knowledge needed to teach complex concepts, simplifying even the most challenging topics for clearer and more efficient instruction. This approach helps teachers achieve high levels of student academic performance while increasing classroom efficiency, which in turn enhances the institution's reputation.

A customizable teaching approach provides personalized instruction tailored to the unique needs of each student. This approach helps teachers implement more relevant and effective teaching strategies for improved classroom engagement and learning outcomes.

The cognitive teaching approach encourages teachers to refine their own teaching methods and focus on areas where individual students need more attention in their classroom learning. This approach helps teachers monitor their students' learning levels and guide them toward better academic performance.

Teachers play an important role as a bridge between students, industry, and educational institutions. By connecting these three aspects, teachers can help students gain the practical skills

and knowledge needed for employment. This also helps educational institutions develop course curricula and ensure their relevance to industry requirements and standards. Teacher communication with industry experts helps the institution organize regular student training and placement preparation. Regular industrial visits for teachers help the institution structure its curriculum to align with industry standards. This role and guidance from teachers facilitates a smooth transition from education to employment for students while maintaining industry relationships and the institution's reputation for placement success. Through professional learning communities (PLCs) and regular faculty development programs (FDPs), teachers can continually develop their knowledge and adopt innovative teaching methods that ultimately benefit the student learning environment. PLCs provide a structured space for teachers to collaborate regularly and act as a platform to share experiences and learn from each other. Participating in PLCs allows teachers to discuss their real challenges and find solutions by implementing new ideas and testing different teaching approaches. This collaborative learning helps teachers discover new strategies, such as more effective technology integration and the use of student-centered teaching and learning techniques. Long-term collaboration through PLCs supports teachers in improving their teaching strategies and becoming more effective in the classroom. FDPs, on the other hand, provide professional training opportunities where teachers can learn from experts and gain insights into the latest trends related to e-learning platforms, domain-specific teaching, customized learning, and cognitive learning approaches. These programs support teachers in adapting practical tools and knowledge needed to implement an innovative teaching culture that meets evolving educational standards. When teachers regularly engage in PLCs and FDPs, they not only improve their teaching methods but also enhance student engagement and achievement. This ongoing professional development ensures that teachers can adapt to the changing needs of students and educational environments, fostering better learning outcomes. This study suggests that schools and educational institutions should adopt a combined approach to professional development by introducing the four methods outlined above and promoting teacher collaboration through regular PLCs and FDPs. By doing this, teachers can continually improve their teaching methods to achieve the best learning outcomes for all students.

## **IX. RECOMMENDATIONS**

**Invest in Digital Learning Infrastructure:** Schools and educational institutions must invest in digital learning infrastructure to empower teachers with the technology necessary to improve their teaching skills. Educational institutions should provide infrastructure to access e-learning platforms, interactive learning software, and digital tools, helping teachers create more dynamic and engaging classrooms. Facilitating access to digital learning tools helps teachers address the diverse needs of individual students. For example, with e-learning platforms, teachers can provide tailored resources and assessments to differentiate instruction based on individual learning styles. Using technology in the classroom helps students develop essential digital literacy skills, crucial in 21st-century education.

**Offer Subject-Specific Professional Development for Teachers:** Subject-specific professional development training, including workshops, seminars, and skill-building sessions, should be designed for teachers in various subject areas. These programs help teachers address unique challenges and meet the specific needs of their students. For instance, science teachers would benefit from workshops on conducting classroom experiments or integrating STEM (science, technology, engineering, and mathematics) projects into their lessons. Similarly, language teachers

may need training to improve students' writing and communication skills by presenting lessons clearly and engagingly. Subject-specific training not only boosts teachers' confidence but also helps simplify complex concepts for better student understanding. Teachers supported by educational institutions are more likely to inspire a passion for learning among their students and demonstrate the effective application of their subjects in practice.

**Promote Customized Professional Development Within Institutions:** Every teacher faces unique challenges and has specific areas for personal growth. Therefore, it is necessary to promote individualized professional development programs within institutions for the benefit of the teaching community. Tailored professional development helps teachers focus on their individual needs. Whether it involves learning new technology, improving classroom management skills, or refining student engagement strategies, institutions should offer flexible professional development options that meet teachers' unique needs. This can be achieved by providing various opportunities, such as online courses, one-on-one faculty training, faculty exchange programs, and workshops tailored to specific areas where teachers want to develop skills. Institutions should also promote self-assessment and goal-setting to empower teachers to take ownership of their professional growth. Tailored professional development not only benefits teachers but also leads to better outcomes for students. When teachers receive training that directly addresses their challenges, they can introduce new strategies and use them effectively in the classroom. For example, teachers struggling with classroom management can receive targeted training, leading to immediate improvements in student behaviour and a better overall learning environment.

**Implement Self-Evaluation for Continuous Career Development:** Teachers who participate in self-assessments gain a deeper understanding of how their teaching affects student outcomes and can adjust their teaching methods accordingly. Reflective teaching involves reviewing lesson plans, student participation, and regular evaluation results to identify what works well and what needs improvement. Teachers can evaluate their teaching strategies by keeping a diary and recording progress for self-analysis. Participating in peer observation or self-assessment activities also helps teachers become more aware of their weaknesses, enabling them to make informed decisions to improve their teaching. A continuous self-assessment process helps teachers stay updated, adaptable, and responsive to the changing needs of their students, ensuring they remain effective in the classroom and achieve good results.

**Encourage Collaboration through PLCs and FDPs:** Professional learning communities (PLCs) provide a forum for teachers to discuss teaching strategies and reflect on classroom experiences with peers. These collaborative discussions help teachers discover innovative teaching methods and develop new ideas to improve student engagement and success. Teachers can also observe each other's teaching methods and provide constructive feedback. To promote a culture of shared learning and responsibility, regular Faculty Development Programs (FDPs) should be conducted at the institutional level to keep teachers informed about the latest trends and innovations in education. FDPs provide structured opportunities for teachers to learn new skills, explore advanced teaching techniques, and stay abreast of changes in the curriculum or educational policy. By implementing FDPs, institutions ensure that teachers remain engaged, confident, and prepared to meet the evolving demands of their profession. Teachers who participate in these programs are also motivated to use new strategies in the classroom, leading to continued professional growth. This growth directly benefits students by creating more innovative, engaging, and effective teaching methods. This study suggests that educational institutions should prioritize developing a structured FDP schedule to promote continued training and development throughout the academic year, considering teachers' well-being and professional excellence.

Encourage Industry-Aligned Teaching for Faculty: A key issue facing many educational institutions is the gap between academic learning and current industry needs. Educational institutions and faculty often lack exposure to current industry practices and technologies, resulting in outdated curricula that fail to equip students with the skills demanded by the workforce. Institutions should not restrict faculty from integrating relevant industry practices into their teaching to bridge this gap. Institutions should create opportunities and a supportive learning environment for their faculty, regardless of salary concerns, pressure to rush through the syllabus, or penalties for working hours. Institutions should support and encourage faculty to engage with industries by arranging regular industry visits, faculty internships, and sabbaticals to gain a deeper understanding of industry advancements, practices, and technological innovations. This industry exposure will help faculty enhance their curricula and implement industry-relevant teaching methods to nurture their students in all aspects of the industry. Such initiatives will help institutions improve students' employability, career success, and overall quality of education by adopting industry-relevant curricula, thereby benefiting both students and faculty through continuous development.

This study recommends that institutions focus on collaborative initiatives such as professional learning communities (PLCs) and faculty development programs (FDPs), which are important components of continuing professional development. These programs encourage collaborative peer learning, sharing best practices, and continued growth among teachers. In addition, training programs should be tailored to meet the unique needs and challenges of different disciplines to ensure effective and long-term improvements in teaching and learning for the benefit of the teacher and student community at large.

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