

Categorization of Outcomes of Teacher Professional Development in Higher Education Institutions – Findings from a Thematic Literature Review

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ABSTRACT

Higher education substantially contributes to the nation's economic development by supporting stable and prosperous societies. The key elements that influence higher education's effectiveness are teacher proficiency and teacher engagement. Therefore, higher education institutions must focus on pedagogical aspects that will enhance teacher proficiency and engagement. To identify appropriate pedagogical approaches, it is important to understand the outcomes of Teacher Professional Development (TPD). The paper aims to identify the main themes of TPD through inductive thematic analysis. Based on our findings the major outcomes of TPD can be categorized as a) Cultural aspects b) Professional aspects c) Social aspects and d) Affective aspects. The findings of this paper will contribute to creating a pedagogical framework for the development, implementation, monitoring, and evaluation of Teacher Professional Development initiatives for Higher Education Institutions (HEIs) and identify the specific impact of each of the four themes to enhance educators' practice and student outcomes.

Keywords: *Teacher Professional Development, Higher Education, Literature Review*

1. INTRODUCTION

The requirements of the 21st century, quality higher education must strive to cultivate virtuous, thoughtful, well-rounded, and inventive individuals. A quality higher education must facilitate personal achievement and enlightenment, as well as constructive public engagement and productive contribution to society. It must facilitate economic independence and prepare students for more meaningful and satisfying lives and careers. Therefore, the purpose of a quality higher education goes beyond the enhancement of individual employment opportunities. It is the key to more vibrant, cooperative, and socially engaged communities, as well as a joyful, more cohesive, productive, innovative, progressive, and prosperous nation (NEP, 2020).

The most significant factor in the success of higher education institutions is the competence and engagement of its faculty. As per several studies, university lecturers are extremely dedicated to their research, whereas teaching is viewed as an obligation and, as a result, a less significant component of an academic career path (Muttonen & Vilppu, 2020). In most cases, a productive and successful researcher is not necessarily a successful instructor. Knowledge production and knowledge sharing require distinct professional skills, and both must be fostered to fulfill the two primary roles of a university instructor (Yürekli Kaynarda et al., 2019).

Hence, universities must place a high priority on teacher development, by providing academic staff with the necessary support and training for their position as teachers. To support student learning as effectively as possible, teachers must possess high-quality pedagogical expertise, which includes an understanding of pedagogical concepts and theories, as well as a situation-specific ability to notice and interpret significant interactions during teaching-learning situations (Wolf et al., 2017).

In recent years, the impact of TPD focusing on areas like self-efficacy, digital literacy, collaboration and cooperation, sustainability development, and so on has grown globally. However, limited studies have been taken to assimilate the various outcomes under specific themes. This paper aims to understand the major outcomes of TPD and relate them to specific themes through a thematic review of the literature that has been published in this field.

2. METHODOLOGY

2.1 Procedure

The literature search was carried out by using the Scopus database. The following search terms were used “Pedagogical training”, “Teacher training”, “Teacher education” and “Teacher professional development” or “Pedagogical staff development” and “Higher education”.

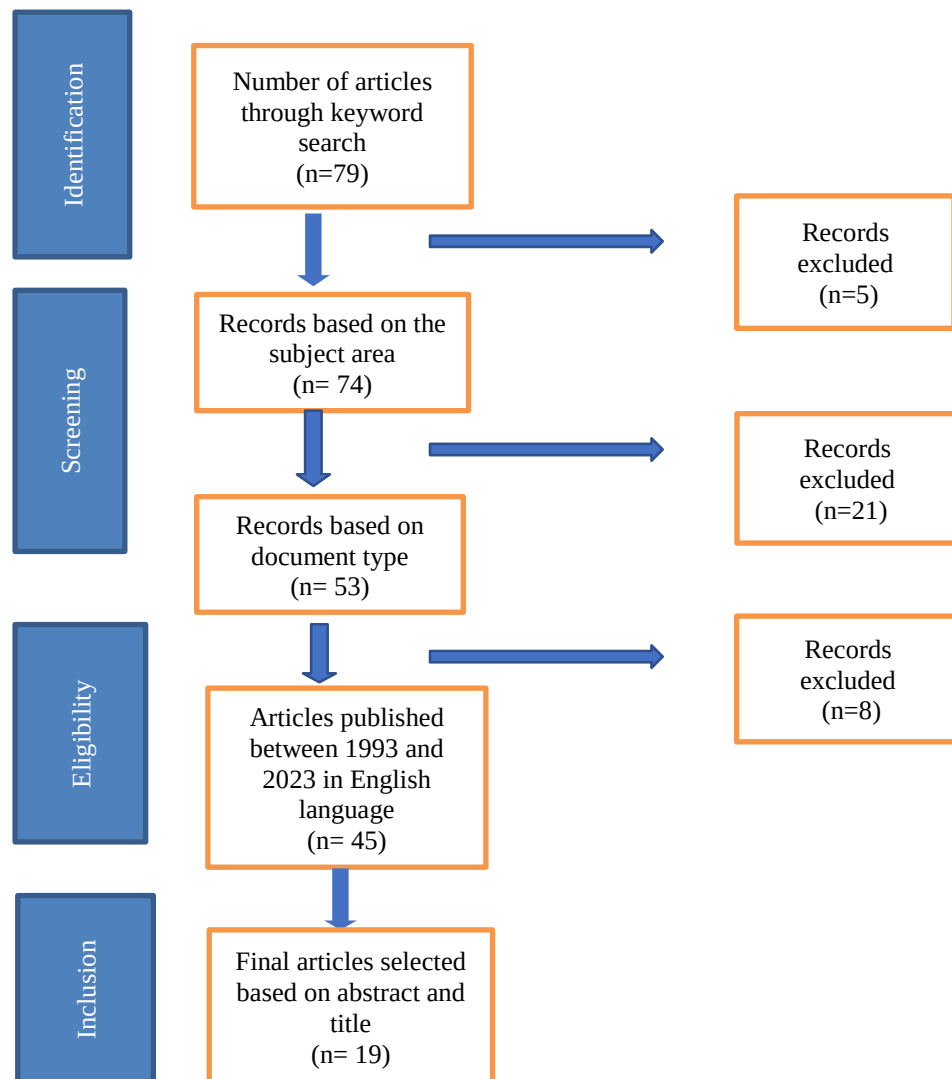


Fig.1. Steps involved in Literature search

2.2 Data

The searches yielded 79 hits from which researchers selected manuscripts with a main research focus on higher education. The selection was narrowed to a set of studies using the following criteria: -

- a) Manuscripts in English;

- b) Studies from peer-reviewed journals;
- c) Manuscripts published between 2013-2023;
- d) Manuscripts limited to social sciences, arts and humanities, psychology and business, management and accounting.

2.2.1 Trends in Number of Articles

Out of the 79 papers that satisfied the study's requirements, which were published between 2013 and 2023, the general trend (Figure 2) indicates a consistent rise in the quantity of publications published over time. Pre-2019 (before COVID-19) and post-2019 (after COVID-19) are the two stages into which the periods can be separated. Before 2019, the field developed slowly; nevertheless, following 2019, there was a discernible increase in articles, which peaked in 2021. This suggests that there has been a substantial change in teacher professional development as a result of COVID-19.

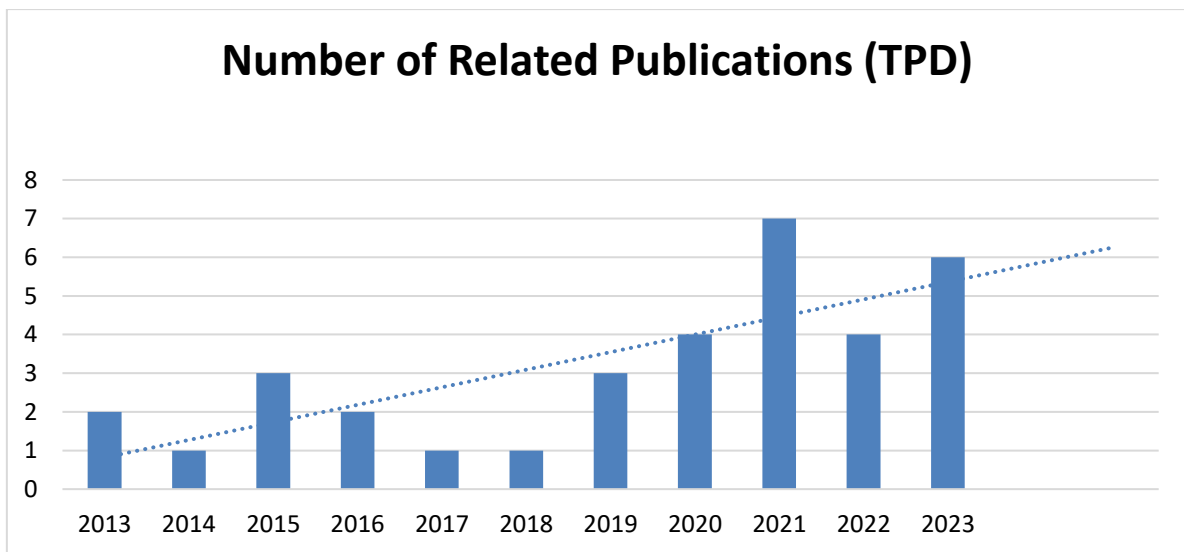


Fig.2. Number of publications (TPD) from 2013 to 2023

2.2.2 Number of Countries Engaged in TPD

In addition to the analysis done in this study, the researchers identified the nations and their level of engagement in TPD using bibliometric analysis.

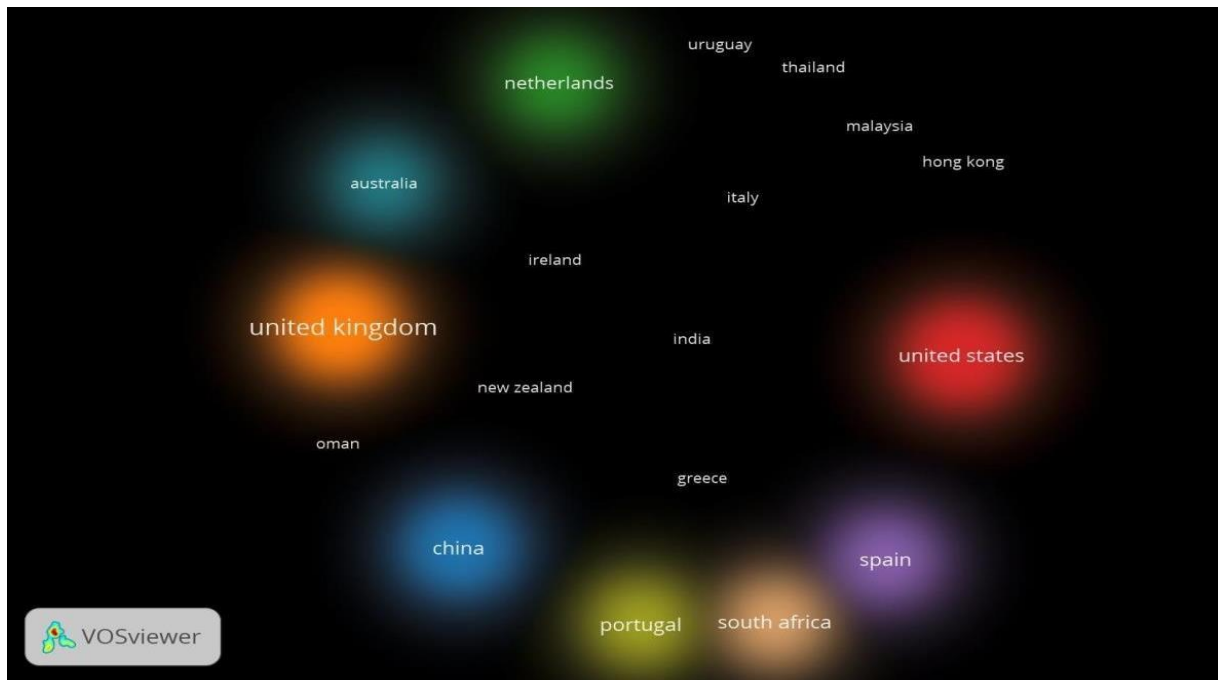


Fig.3. Countries engaged in TPD

According to Figure 3, the two countries with the most engagement in TPD are the United Kingdom and the United States, whereas China, Portugal, South Africa, Spain, Australia, and the Netherlands have a more moderate level of interest. Uruguay, Thailand, Malaysia, Hong Kong, Ireland, Italy, India, New Zealand, Greece, and Oman are the countries with little engagement. Hence, this study may serve as a guideline for higher education institutions for the identification of effective pedagogical courses for the holistic professional development of teachers in other countries including India.

2.3 Thematic Cluster-Level Analysis

A thematic analysis has been used to answer the question ‘What are the outcomes of TPD in higher education?’ ‘Thematic analysis (TA) is a method for methodically locating, structuring, and providing insight into patterns of meaning (themes) across a dataset. The provided VOS viewer visualization maps the relationships between key themes and concepts related to teacher professional development in higher education. The clusters indicate areas of focus such as pedagogical training, teacher education, and teacher training, and teacher Professional development.

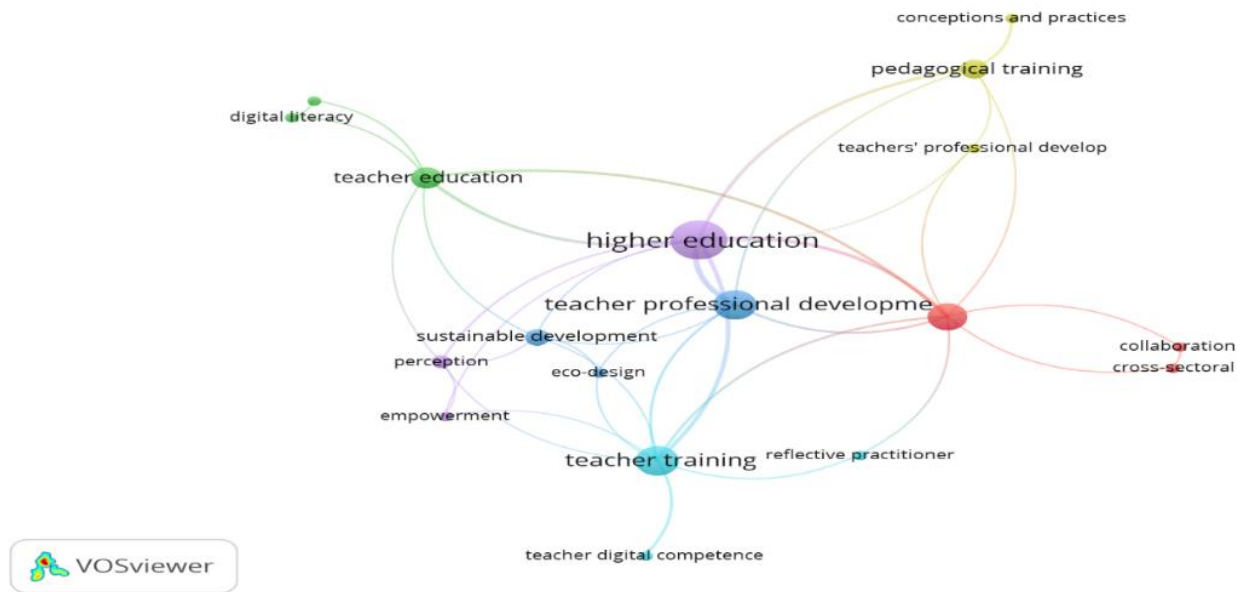


Fig. 4. TPD studies thematic maps. Note: This figure was generated using VOS viewer software

The largest node, "higher education," is centrally connected, emphasizing its pivotal role in facilitating and influencing teacher professional development. Key themes such as "teacher professional development," "teacher education," and "teacher training" are closely interconnected, reflecting the comprehensive approach required for effective teacher training programs.

Each cluster indicates a thematic representation. Cluster names are given based on keyword frequency in the cluster. Figure 4 shows a summarized keywords network, and keyword color represents the association of clusters and the coordination of keywords assigned by calculation of distance measure. We found six keyword clusters (**See Table 1**).

CLUSTER 1 Red	CLUSTER 2 Green	CLUSTER 3 Violet	CLUSTER 4 Yellow	CLUSTER 5 Purple	CLUSTER 6 Blue
Collaboration	Digital Literacy	Eco- Design	Conceptions and Practices	Empowerment	Reflective Practitioner
Cross-Sectoral	E-Learning	Sustainable Development	Pedagogical Training	Perception	Teacher digital competence
Professional Development	Teacher Education	Teacher Professional Development (TPD)	TPD		Teacher Training

Table 1. Keywords Cluster

3. RESULTS AND DISCUSSION

In Fig 1 depicted above lists, 19 meta-studies to describe outcomes of teacher professional

development in Higher Education Institutions (HEIs). The following section will highlight and label clusters to each theme namely a) Cultural aspects b) Professional aspects c) Social aspects d) Affective aspects (**refer Table 2**).

Classification of Clusters into Various Themes			
Cultural Aspects	Professional Aspects	Social Aspects	Affective Aspects
• Teacher collaboration and group communication • Cooperation. • Group dynamics.	• Pedagogical practices in the classroom • Networking skills and goal-setting skills improved • Digital literacy • Technological pedagogical content knowledge (TPACK) enhanced • Problem-solving skills • Active learning and being reflective	• Sustainable development practices in the community • Eco-design skills	• Satisfaction, Teacher conception and Teacher perception • Optimism and Feeling of commitment • Self-confidence and Self-efficacy

Table 2. Classification of Clusters into Various Themes

3.1 Cultural Aspects (Cluster 1):

Communication and collaboration were the results of the study conducted by (Eidin & Schwartz, 2023; Rahimi & Tafazoli, 2022). A study conducted by (Ebersöhn & Ferreira, 2015) resulted in group communication and positive group dynamics. Cooperation was the outcome of studies conducted by (Manca & Ranieri, 2017; Kanellopoulou & Darra, 2019). These studies illustrated how TPD led to collaborative learning strategies within a professional learning community. As a result, the researcher has categorized these outcomes under the heading “Cultural aspects”.

“Cultural aspects” refer to the cooperative methods required for the development of educational organizations (Fiona King, 2014). The majority of studies of cultural aspects focus on how they affect teachers' informal or formal relationships with one another within a professional learning community. Additionally, incorporating collaborative components into professional development programs is consistent with a sociocultural perspective and understanding of the way societal variables influence the formation of knowledge (Pitsoe et al., 2012). According to the studies considered in this review, the cultural aspects that were addressed are a) Teacher collaboration b) Group communication c) Cooperation d) Group

Dynamics.

3.1.1 Teacher Collaboration and Group Communication

A professional development model was developed in Israel to support in-service teachers in situations where long-term PD programs are unfeasible. Their learning and overall experience were enhanced by this model, which also brought about the collaborative part of the PD. They also discovered that collaboration would enable them to share the workload that comes in a diversified nature (Edin & Shwartz, 2023). In both public and private universities in Iran, researchers looked at how teachers were trained in digital competencies of the twenty-first century and how they perceived integrating ICTs into higher education. In light of these findings, it can be concluded that there is a strong and positive relationship between teachers' perceptions of using ICTs in the classroom and their communication and collaboration skills (Rahimi et al., 2022).

3.1.2 Cooperation

The study discussed using social networking sites for digital competency training and teacher professional development (Manca & Ranieri, 2017). For both pre-service and in-service teachers, social networking has steadily become a crucial component of advancing professional development and creating a professional identity (Kimmons and Veletsianos 2014). From this perspective, social networking sites may perform two distinct functions namely coordination and cooperation within a community of users (Manca & Ranieri, 2017).

3.1.3 Group Dynamics

One approach to teacher development is accomplished through partnerships. The development of competencies and skills in psychological care and support is achieved through partnerships between higher education researchers and teachers which resulted in constructive group connections among teachers that demonstrated an exchange of knowledge, team spirit, and a sense of belonging in their groups, which produced a caring, encouraging, and supportive atmosphere that led to close interpersonal ties among teachers (Ebersöhn et al., 2015). Lesson study is an additional strategy for professional development. It is a technique for enhancing knowledge for both teachers and students. The results demonstrated the growth of pre-service teachers' cooperation (Kanellopoulou, 2019).

3.2 Professional Aspects (Cluster 2 + Cluster 6)

A study carried out by (Mavuso & Mzilikazi, 2022) showed improved pedagogical practices in the classroom. Improvement in networking, goal setting, monitoring skills, and problem-solving skills were the results of the study done by (Ebersöhn & Ferreira, 2015). A study conducted by (Rahimi & Tafazoli, 2022) resulted in the development of digital literacy and problem-solving skills. Enhancement in technological pedagogical content knowledge (TPACK) was the result of the study conducted (Huang & Zhao, 2021). Active learning and reflection were the results of the studies carried out by (Abaci & McNeill, 2021; Murthy & Warriem, 2015). These studies showed improvement in knowledge, skills, and abilities as a result of training and professional activities so the researcher has categorized the outcomes under the heading “Professional aspects”.

“Professional aspects” refer to the ability to perform tasks successfully based on knowledge, skills, and abilities gained during training and professional activities (Boud & Molloy, 2013). Developing professional competencies among teachers in higher education is important as higher education has been expanding rapidly which needs important stakeholders of education namely teachers and students to be in pace with the evolving labor markets. As a result, training and various professional activities are carried out to help teachers create new theoretical knowledge and practical experience, which would help them enhance their teaching methods and positively impact students' academic growth and skill development (Omar et al., 2018).

According to the studies considered in this review, the professional aspects that were addressed are a) Pedagogical practices in the classroom b) Networking and Goal-setting skills c) Digital literacy d) TPACK e) Problem-solving skills f) Active learning and being reflective

3.2.1 Pedagogical Practices in the Classroom

A study was carried out in South Africa where teacher preparation programs helped them incorporate knowledge regarding climate change in their teaching. Hence, a 5-day training program on climate education was conducted for teachers in higher education which resulted in improved pedagogical practices in the classroom, thereby recommending that TPD programs must be carried out continuously (Mavuso et al., 2022).

3.2.2 Networking and Goal-Setting Skills

South Africa is a developing nation with poor standards for education, a high rate of illiteracy, higher crime rates, more unstable housing, and less social support (Dass-Brailsford, 2005). Hence, the fact that South Africa is the most unequal society in the world (OXFAM 2013, The World Bank, 2012) makes it a place to examine problems in the high-risk and high-need area of education, which demands that teachers have the skills necessary to fulfill their professional role in providing psychosocial support and care. Since there is a high need for in-service training and few formal structures for teacher professional development, this study examines the collaboration between higher education researchers and teachers in this high-risk and high-need education sector as a means of fostering social and political change. Therefore, this study was able to encourage the development of goal-setting abilities in teachers so that they may formulate, plan, and act on goals as well as form partnerships with other people and organizations, such as NGOs, to give psychosocial support (Ebersohn et al., 2015). Similarly, other countries must identify the most pressing needs and accordingly provide TPD to the teachers.

3.2.3 Technological, Pedagogical, and Content Knowledge (TPACK)

The study provides experiential evidence of designing and evaluating a training program for engineering educators in China to improve their sustainability competency. Here, the training concentrated on developing content knowledge and teaching methods on eco-design thereby improving four elements of technological, pedagogical, and content (TPACK) knowledge (Huang et al., 2021).

3.2.4 Problem-Solving Skills

South Africa, is a developing country where the education sector is commonly characterized as having a high risk and high demand. In such a field of education, teachers must play roles other than those of learning facilitators, such as those of psychosocial support and care, which call for further professional development. As a result, the educators received in-service teacher training, and the abilities they displayed in terms of managerial skills included problem-solving (Ebersohn et al., 2015). A rise of similar competencies among university professors was observed due to the introduction of teacher training programs by the European framework for the digital competence of educators (DIGCompEdu) to improve their 21st-century digital competencies and manage their classes with ICTs (Rahimi et al., 2022).

3.2.5 Active Learning and Being Reflective

The study concentrated on the professional growth of engineering college faculty in Information and Communications Technology (ICT) integration. The success of the program lay in the feature of keeping participants engaged with program content and ensuring effective learning through an active learning strategy, and reflection was provided via formative feedback on participants' performance, which is important to close the teaching-learning loop (Murthy et.,2015). When there was an emergency, such as a pandemic, professional learning was developed for teachers who required pedagogical expertise pertinent to online instruction. Emergency remote learning necessitates specialized teacher skill sets. To help course designers, concentrate on both pedagogy and teacher preparation, a framework was established for the program's development that promotes reflection and active learning (Abaci et al.,2021).

3.3 Social Aspects (Cluster 3)

Enhancement of sustainability awareness and eco-design skills were the results of the study conducted by (Huang & Zhao, 2021). A study carried out by (Costa & Pinho, 2023) increased Sustainability development practices in the community. These studies focused on teachers adopting practices leading to social investment and building safe and caring communities, therefore the researcher has categorized these outcomes under the heading “social aspects”.

The “social aspects” refer to poverty reduction, social investment, and building safe and caring communities thereby creating a society that is economically, socially, and environmentally sustainable (Mensah, 2019). Teachers benefit from socially centered education by better understanding the core values of future education and also see the educational content as an opportunity to equip students with the skills and knowledge they need to function in a world of rapid and systemic change. This calls for a focus on the requirements of educational policies, curriculums, and practices that are specifically geared toward social factors in teacher education and professional development (Brandisauskiene et al.,2020).

According to the studies considered in this review, the social aspects that were addressed are a) Sustainable development practices in the community and b) Eco-design skills.

3.3.1 Sustainable Development Practices in the Community

A teacher professional development program was implemented in Portugal to promote, increase, and disseminate sustainable development practices in the community. This program promoted Sustainable development goals (SDGs) in the context of sound physics, specifically by raising knowledge of the risks of noise pollution and their effects on health and well-being. It was found that instructors and students understood the risks posed by noise pollution and the precautions that should be taken to avoid them (Costa et al., 2023).

3.3.2 Eco-Design Skills

The study carried out in China, evaluated teacher training programs for sustainability competency enhancement in higher education among engineering educators. The training program focused on structuring content knowledge and teaching methods on eco-design. It validated the need to focus teacher professional development on sustainability and eco-design abilities (Huang et al., 2021).

3.4 Affective Aspects (Cluster 4 + Cluster 5)

A study carried out by (Fernandes& Abelha, 2023), resulted in higher satisfaction, improved teacher conception, and improved teacher perception. Self -confidence feelings of commitment and optimism were the results of the study done by (Ebersöhn & Ferreira, 2015). A study carried out by (Eidin & Schwartz,2023) resulted in improved self-efficacy. These studies demonstrated the shift in teachers' attitudes, feelings, and emotions as a result of TPD. Therefore, the researcher has categorized the outcomes under the heading "Affective aspects".

“Affective aspects” refer to emotions, feelings, attitudes, and so on, which play a significant role in learning as well as teaching. It can be deduced that teachers with high affective aspects have a high level of learning intake thereby contributing to whole-person development. Thus, these factors support teachers in improving the quality of their teaching while promoting students' overall growth (Ni, 2012). According to the studies considered in this review, affective aspects that were addressed are a) Satisfaction b) Teacher conception c) Teacher perception d) Optimism e) Feeling of commitment f) Self-confidence and Self-efficacy.

3.4.1 Satisfaction, Teacher Conception, Teacher Perception

In this study, Fernandes et al., (2023) evaluated the impact of pedagogical training courses on teacher professional development, they discovered that teachers were more satisfied with pedagogical training, particularly with the relevance of the contents and the trainer's performance, which encouraged active participation by teachers, thereby improving their conceptions and perceptions of the impact of pedagogical training on teacher professional development. Since enhanced teacher conception, perception, and level of satisfaction demonstrate the shift in their physiological, cognitive, and behavioral experiences as a result of TPD, this can be referred to as an emotional change (Krakowska,2020).

3.4.2 Optimism and Feeling of Commitment

In this study, in-service training was facilitated in collaboration with researchers in higher education so that teachers could take on roles other than those of educational facilitators, resulting in the professional growth of teachers. Through this training, teachers have developed feelings of commitment, dedication, and preservation and their behavior revealed a sense of optimism about reaching their goals and their capacity to frame difficulties optimistically (Ebersohn et al., 2015). Since findings of TPD led to the growth of commitment and feelings of optimism, which depict an individual's unique subjective description of emotions known as feelings (Krakowska,2020).

3.4.3 Self-Confidence and Self-Efficacy

The study describes a scenario of South Africa, a developing country where the education sector is commonly characterized as having a high risk and high demand. In such a field of education, teachers must play roles other than those of learning facilitators, such as those of psychosocial support and care, which call for further professional development. As a result, the educators received in-service teacher training, and the abilities they displayed in terms of intrapersonal skills included increased self-confidence (Ebersohn et al., 2015).

One of the most well-known theoretical and practical frameworks created to enhance scientific literacy is Socio-Scientific Issues (SSI), which was backed by a short-term Professional Development (PD) course conducted by a university in Israel. This study suggests a thorough professional development program that prepares teachers to adopt SSI and thus this program had a substantial positive effect on teachers' self-efficacy, which finally led to the implementation of SSI in their classrooms (Eidin & Schwartz, 2023). The findings of TPD resulted in enhanced self-confidence and self-efficacy that in turn

influence human beliefs and preferences commonly referred to as attitude. (Krakowska,2020).

Outcomes of Teacher Professional Development

Table 3 presents the consolidation of various themes and their outcomes achieved through different types of training, thereby underscoring the multifaceted nature of teacher professional development, illustrating how various domains and competencies intersect to form a holistic framework for enhancing educational practices in higher education.

THEMES	OUTCOMES	TYPE OF TRAINING
Cultural Aspects	• Teacher collaboration and Group communication Improved	Short-term professional development programs resulted in collaboration and group communication
	• Development of Cooperation	Social networking sites serve as essential tools for enhancing digital competency training and professional development among teachers, facilitating both community coordination and cooperation.
	• Positive Group Dynamics	Partnerships between higher education researchers and teachers cultivate psychological care competencies, fostering a supportive environment for professional growth, while lesson study enhances teacher and student knowledge through increased cooperation among pre-service teachers
Professional Aspects	• Improved Pedagogical Practices in the Classroom	Training programs for higher education teachers enhanced classroom pedagogical practices, emphasizing the necessity for ongoing TPD.
	• Improved Networking and Goal – Setting Skills	Inservice training resulted in the development of goal-setting abilities in teachers so that they may formulate, plan, and act on goals as well as form partnerships with other people and organizations, such as NGOs, to give psychosocial support
	• Increase in Digital Literacy	Pedagogical training in digital literacy and content creation skills has led to favorable attitudes among teachers toward integrating ICTs into their classroom teaching
	• Enhancement of Technological Pedagogical Content Knowledge (TPACK)	The training program for engineering educators resulted in enhanced TPACK knowledge.
	• Development of Problem-Solving Skills	The in-service training aimed at enhancing teachers' managerial and digital skills led to improved problem-solving abilities among educators.
	• Active Learning and Being Reflective	Teacher training focusing on the enhancement of ICT integration among engineering college faculty through active learning strategies and formative feedback is crucial for their professional growth. Thus, also emphasizes developing specialized pedagogical expertise for emergency remote learning situations, promoting reflection and effective course design.
Social Aspects	• Improved Sustainable Development Practices in the Community	A teacher professional development program focused on integrating Sustainable Development Goals (SDGs) fostered the adoption of sustainable development practices among educators and students, contributing to the establishment of a sustainable community.

	• Enhancement in Eco- Design Skills	Teacher training programs in higher education aim to enhance sustainability competencies, with a focus on eco-design content and teaching methodologies.
Affective Aspects	• Higher Satisfaction, Improved Teacher conception, and Improved Teacher perception	Pedagogical training positively impacts teacher professional development by enhancing teachers' conceptions, perceptions, and overall satisfaction levels indicating emotional changes, encompassing physiological, cognitive, and behavioral experiences
	• Optimism and Feeling of Commitment	In-service training fostered teachers' professional growth, enhancing their commitment, and optimism reflecting their unique subjective emotions
	• Enhanced Self-confidence and Improved Self-efficacy	In-service teacher training and a short-term professional development program significantly improved teachers' self-confidence and self-efficacy, positively influencing their attitudes.

Table 3: Outcomes of Teacher Professional Development

4. CONCLUSION, LIMITATIONS AND FUTURE SCOPE

This study aimed to define and understand the outcomes of TPD in higher education. The researcher attempted to summarize the research on this topic using inductive thematic analysis. Contrary to prior reviews, the major contribution of this work was to assimilate the various outcomes of teachers' professional development under specific themes. As a result, researchers proposed four themes namely 1) Cultural aspects, 2) Professional aspects, 3) Social aspects, and 4) Affective aspects, thereby describing how they influence teachers' development and lead to the growth of higher education institutions.

Higher education institutions have a significant impact on students' habits and contribution to a prosperous society (Žalėnienė & Pereira, 2021). Therefore, teachers must receive effective pedagogical training as they are the pioneering agents in incorporating knowledge, abilities, attitudes, and values into the students who are future leaders and whose practices will help the nation grow economically, socially, and environmentally.

This study has certain limitations. Firstly, Thematic analysis is thought to be the most suitable method for data analysis when the researcher's goal is to extract data to assess the coherence of variables related to various scenarios within the same study. However, it may vary based on the subjective knowledge of the researcher. Secondly, the sample of papers used for the literature study was only drawn from the Elsevier Scopus database.

However, this work contributes to the body of literature by categorizing the elements that have an impact on teachers through training and professional development activities. Thereby, elaborating that higher education institutions should prioritize teacher development initiatives that will benefit students and, in turn, aid in the growth of higher education institutions, which

is crucial for the nation's scientific, economic, and social development (Sirswal,2016).

India is a growing country with the third-largest student population in the world after China and the United States, yet its universities are still not included in the top 100 (QS World University Ranking, 2023). This necessitates the creation of a framework that adheres to the NEP, 2020 which calls for providing facilities for teachers' continuous development, implementation, monitoring, and evaluation of Teacher Professional Development initiatives for HEI institution administrators and policymakers. It will also set an agenda for future researchers to identify the specific impact of each of the four themes identified to enhance educators' practice and student outcomes.

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