TRANSFORMING TEACHER DEVELOPMENT THROUGH MICROLEARNING: INSIGHTS FROM LAHORE, PAKISTAN

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Abstract

The study explores the effectiveness of microlearning in the context of professional development (PD) for teacher-educators who teach in institutions located in Lahore, Pakistan, as opposed to conventional PD that is typically delivered over extended periods of time, including through workshops. With its brief and focused nature in digital form, there appears to be a quick training alternative. This research will focus on assessing the role of microlearning in transforming teacher educators' professional development and how it influences various developmental factors. Research Design: The study used a survey research design and data were collected from 217 Teacher Educators of public and private universities of Lahore. It is finally concluded that the microlearning use is moderate, but it is highly valued in terms of access, flexibility and fitting into their busy schedule. Microlearning about two thirds (68%) of the respondents saw microlearning to boost engagement, retention, and lifelong learning. Quantitative analysis demonstrated that the frequency of microlearning usage was positively associated with professional development outcomes, and the variance (effect size) on development could capture about 30% by microlearning. Gender and job titles were found to be factors influencing microlearning, while experience and university type did not influence the perception of effectiveness. These results indicate that microlearning presents a potential medium for promoting teacher professional growth in low-resource contexts such as Pakistan. Nevertheless, obstacles such as platform unawareness, digital competences and lack of institutional support need to be addressed for microlearning to become a reality in teacher training.

Keywords: *microlearning; professional development; teacher educators; CPD; higher education; teacher training; bite-sized learning*

Introduction

In recent years, microlearning has rapidly evolved as a game-changer in the professional development (PD) domain, which is especially applicable to teacher educators who are constantly suffering from a tight schedule. The term microlearning is used to describe the practice of learning through short, focused, and very relevant training materials which can be accessed on demand. This strategy is flexible, which means there are lots of options through it and can be done by educators who do not have time to allocate to long-term PD activity that takes longer (Kohnke & Moorhouse, 2023; Zameer, 2025).

This calls for more flexible and learner-centered professional development provisions, which have been particularly exacerbated since the rapid proliferation of technology in education at large, including in light of unprecedented challenges brought along with the COVID-19 response. Teacher educators especially need ongoing professional development to maintain currency in pedagogy, educational technologies and content. In pedagogy, student centered methods have been emphasized for higher order and critical thinking skills (Jamil et al., 2024;

Naseer et al., 2022). Conventional PD strategies such as extensive workshops or seminars are now being considered as insufficient to meet the diverse and dynamic requirements of teachers, especially in developing countries like Pakistan (Abbas et al., 2021; Ashfaq, 2025).

Microlearning has caught the attention of many countries in enhancing adult learning engagement, retention and motivation, one being teacher educators. Microlearning is effective in enhancing the retention of knowledge and the transfer of acquired content into real-life situations (Zhu et al, 2024). Countries such as Australia, Hong Kong and Brazil have successfully implemented microlearning in teacher PD programs, teaching practices, resulting in an increased confidence of teachers (Kohnke & Foung, 2023; Silva et al., 2025). Even though microlearning has been successful in the world, its application in teacher education is still limited (Akbari & Tatari, 2025), especially in urban areas such as Lahore.

The present study aims to bridge this research gap by exploring the use of microlearning for PD among teacher educators in Lahore, Pakistan. It seeks to understand teacher educators' perceptions of microlearning and its relevance in their professional development. This knowledge will assist policymakers and educational institutions to develop more effective and context-sensitive PD programs and ultimately enhance the quality of teacher education in Pakistan.

The findings of the present study have implications for educationists and all those involved in educational activities. PAR effectiveness on teacher educators' professional development in Lahore, Pakistan. The study is significance for teacher educators as These videos will also be helpful for Teacher Educators as they work to explore how microlearning can best fit into their teacher professional development programs. The results are interesting also for HEIs, those involved in TE, Organizations can take advantage of these insights to tailor their PD offers more closely to teacher educators' needs, incorporating adaptable, accessible and learner-centered formats. The results of the study will guide the policymakers and regulatory authorities in Pakistan, such as HEC, Provincial Ministries of Education, etc. The research will contribute to the understanding of microlearning and help generate PD content that is bite size, just- in-time and personalized for teachers. This study contributes an addition to the emerging literature on microlearning and teacher education in the Global South. The teacher educators who are willing to do quality PD are more likely to alter their behavior and improve their pedagogical practices, which in turn will help in the students' learning experiences. The quality of classroom teaching, at least the part that results from the preparation of teacher educators, would ripple through the system.

Research Questions

The following research questions guide the investigation into the use of microlearning for professional development (PD) of teacher educators in Lahore:

1. To what extent do teacher educators in Lahore utilize microlearning as a source of professional development?
2. What are the perceptions of teacher educators regarding their professional development needs and practices in relation to microlearning?
3. What is the relationship between the use of microlearning and the professional development of teacher educators in Lahore?
4. Are there significant differences in the use of microlearning among teacher educators based on variables such as gender, years of experience, or institutional affiliation?
5. How do teacher educators perceive the effectiveness of microlearning in enhancing their teaching skills and knowledge retention?

Literature Review

Professional Development (PD) of Teacher Educators

Professional learning is key to maintaining an educated, skilled workforce of educators as their profession changes. PD for teacher educators has historically been presented in face-to-face workshops, conferences and seminars. However, in these traditional models, it is less likely their particular desires are being met to the same extent, particularly when it comes to time, relevancy and ease of access. The demand for more personalized and flexible PD models has grown stronger since the 21st century (Davis, 2023; Dewi et al, 2025).

Now, many PD put more emphasis on learner-centered, technology-embedded models catering to the multiplicity of teachers' needs these years. This is in response to adult learners, who wish for self-directed, context-appropriate, and just-in-time learning experiences (Abubakar et al., 2023). Microlearning is a new model that is well suited to this need, providing short bursts of learning which are delivered in manageable chunks at those moments when the learner has time. Researchers suggest that microlearning appeals to the cognitive preferences of adult learners thereby stimulating motivation, engagement, and retention (Balasundaram, 2024; Zhu et al., 2024), something crucial for teacher educators.

Teacher educators especially have a double burden: teaching and mentoring. The teacher educator must stay current in the field of pedagogy, curriculum development and educational technology due to their significance (Jamil et al.,2024). The job of serving as gatekeepers to the teacher education system makes their continual professional development vital for the quality of teacher preparation programs (Kennedy, 2016). Classical PD models lack the sustained support that teacher educators require, and thus microlearning is an appealing substitute (Kohnke & Foung, 2023).

Microlearning in Teacher Education

Microlearning has been drawing much interest as a successful PD strategy used in TE, especially among those countries where resources are insufficient, and the teacher population is huge. Microlearning has proved to be effective in different types of teacher education internationally. For example, in Hong Kong, Kohnke and Moorhouse (2024) reported that microlearning empowered English language teachers to acquire new knowledge and confidence for use in the classroom. In Brazil, too, Silva et al (2025) conducted a study in which the effectiveness of microlearning on the confidence of teachers and student outcomes was evident as units were small enough to manage.

In Pakistan, the microlearning in teacher education has yet to be fully developed, especially in metropolitan areas such as Lahore. The literature dealing with microlearning is mostly in specific fields, e.g., medical education, where microlearning has already been implemented successfully in postgraduate programs (Shamir-Inbal & Blau, 2022; Monib et al., 2025). The present study is designed to address this gap by investigating microlearning use for PD among teacher educators in Lahore, including examining its possible benefits and challenges.

Benefits of Microlearning

One of the most notable benefits is its versatility. In microlearning, educators get chances to learn at their own pace and location rather than any schedule and place. This is especially relevant for teacher educators who are often "time stretched" by having to schedule PD around timetabled teaching (Kohnke & Moorhouse, 2021).

The other important advantage is improvement in engagement and motivation. Microcontent is broken down into bite-size, interactive pieces that could include videos, quizzes or infographics.

Their inclusion enhances the overall learning experience and keeps learners engaged. Studies have highlighted the impact of content format diversity on microlearning and how it enhances learner engagement and retention—factors pivotal to successful PD (Munawar et al., 2025; Zhu et al, 2024; Balasundaram et al, 2024).

What is more, microlearning offers itself as a personalized learning. Teachers have the ability to select content that applies to them and suits their learning style so that PD can become more personalized. This is contrary to the traditional PD models, which are generally not personalized and cannot be catered to individual experiences or teaching contexts (Abubakar et al, 2023).

Challenges and Limitations of Traditional PD Models

Conventional models of PD, which include workshops and seminars, have been the mainstay for teacher educator preparation. However, these models have been recently criticized for their rigidity and long-term effects. A significant amount of traditional PD is time-framed, does not contain follow-up, and excludes long-term influences on teaching (Anis, 2024). In addition, these courses often do not meet a teacher's needs, particularly when dealing with teacher educators who have multiple tasks that extend beyond classroom instruction (Kennedy 2016).

Besides these drawbacks, conventional PD programs may also be expensive and difficult to organize, especially in developing nations such as Pakistan. Geographical and financial realities make it hard for teachers in rural or under-resourced schools to participate in such programs. Microlearning alleviates some of the problems by offering a relatively inexpensive, expandable and achievable alternative which fits into teacher educators' everyday practice (Mugahed & Al-Abdi, 2025).

The Role of Microlearning in Overcoming Traditional PD Limitations

A potential remedy for effectiveness challenges in conventional PD models is microlearning. Delivered in bite-sized, digestible chunks that are easy to access through digital platforms, microlearning can be achieved despite logistical and time limitations for traditional, in-person PD. Research has demonstrated the benefit of micro learning for professional development, allowing educators to access learning material at a time suitable to them and from any location. This results in PD that is more accessible and flexible (Balasundaram et al, 2024).

In addition, incorporating microlearning that focuses on the autonomy and personalized learning of learners is suitable for teacher educators who struggle with busy schedules. It gives the teacher something to covet at long last, some say in terms of whose priorities inform their PD. This is even more critical in the context of teacher education, when teaching staff must perpetually renew itself and generate knowledge around mentoring future teachers (Kohnke & Foung, 2023).

This expanding literature suggests microlearning as a potential tool to support the professional development (PD) of Teacher Educators. With its capacity to offer short, focused lessons that learners can pull up at any time and any place, Monarch is the perfect fit for busy teachers. Several African and European countries have flourishing microlearning practices. Back home in the land of Pakistan, we hardly know what to make of micro-learning or indeed how it can benefit us as employees, especially when living in urban cities like Lahore. This research aims to fill this void by analyzing the role of microlearning in PD of teacher educators in Lahore and consequently suggesting policy implications for policymakers, academical organizations, and teacher educators. The results will help in generating ideas for better, scalable and context-specific PD programs in Pakistan, thus ultimately benefiting the quality of teacher education in the country.

Research Methodology

The study employs quantitative research design and examines the use, attitudes and impact of microlearning as a PD tool for teacher-educators. The study follows quantitative design with survey methods. The objective of the study is to generate empirical data on the microlearning practices towards professional development among teacher educators in Lahore, Pakistan. The survey methodology is selected for ease of collecting data from a large sample of teacher educators and to enable statistical analysis of the use of microlearning, perceptions toward microlearning and the relationship with professional development outcomes. The population and sample of this study comprise teacher educators from public sector and private sector universities based in Lahore, Pakistan. Lahore is an educational center and has numerous universities that offer teacher training programs. As per the Economic Survey of Pakistan (2021-2022), there are more than 69,000 teaching staff in 252 universities of Pakistan. But the published number of teacher educators in Lahore is not definite, so all faculty members related to teacher education programs in Lahore are considered as the population for this study. Convenience sampling was used because the population is large and resources are limited. Trainee/teacher educators of selected Public and Private Universities of Lahore were included in the study. Convenience sampling permits rapid data collection from the most readily available pool of respondents willing to complete the survey. While this procedure is not truly random, it is appropriate to the study given participant access and the short duration of data collection. The sample size was calculated using De Morgan's table that indicated a minimum of 200 participants. In total, 217 teacher educators were approached to counteract any potential non-responses so that the sample would be representative of the population in question.

Data was obtained from the teacher educators using a structured questionnaire. A new questionnaire was created for this study based on the previous literature related to microlearning and professional development (Abubakar et al, 2023; Zhu et al, 2024). The survey comprised closed-ended and Likert-scale items to assess various factors influencing the impact of microlearning on PD.

The surveys were analyzed with SPSS (Statistical Package for the Social Sciences). The analysis follows descriptive statistics, Correlational analysis, Inferential Statistics (T-test and ANOVA) were used to test the significant differences in microlearning usage and perception among gender, age, designation and year of service. Regression analysis was conducted to determine the predictive nature of microlearning on professional development outcomes. The internal reliability of the questionnaire was tested using Cronbach's alpha. The coefficient of 0.86 indicated that the measure was reliable and accurately measured this phenomenon. Ethical considerations included informed consent and anonymity.

Results of the Study

Table 1: Demographic Profile of Teacher Educators

Sr. #	Demographic Factor	Category	Number of Participants	Percentage (%)
1.	Gender	Male	69	31.8%
		Female	148	68.2%
2.	Age	30-40	149	68.7%
		40-50	65	30.0%
		50+	3	1.4%

3.		Lecturer	151	69.6%
	Designation	Assistant Professor	62	28.6%
		Associate Professor	2	0.9%
		Professor	2	0.9%
4.		1-5 years	32	14.7%
		6-10 years	55	25.3%
	Experience	11-15 years	75	34.6%
		16-20 years	34	15.7%
		20+ years	21	9.7%

This table presents detailed demographics of the study participants. Most of the participants are women (68.2%) and belong to the ages from 30 to 40 (68.7%). The sample is overwhelmingly composed of lecturers (69.6%) and respondents with between 11 and 15 years of teaching experience (34.6%).

Table 2: Teacher Educators' Perceptions of Microlearning (Engagement and Motivation)

Statement	Mean	Standard Deviation
Microlearning involves short, focused learning sessions.	3.28	1.13
I am aware of microlearning platforms (e.g., mobile apps, LMS, social media).	2.80	1.11
Microlearning captures my interest and maintains my focus throughout the lesson.	3.07	1.22
I feel motivated to complete microlearning sessions because they are short and engaging.	3.49	1.18

The findings indicate that teacher educators are positive about microlearning and enjoy it. The highest mean score was 3.49, achieved on the behavioral dimension, which, in microlearning, being short and interesting, encourages the participants to study. However, their awareness of the knowledge of microlearning platforms shows a moderate level of uncertainty (mean=2.80), indicating the gap in platform awareness. This suggests that as well-accepted microlearning is, there might be some work needed to make it a down-to-earth and accessible approach.

Table 3: The time efficiency for microlearning as perceived by teacher educators

Statement	Mean	Standard Deviation
Microlearning fits well into my busy schedule as a teacher educator.	3.13	1.14
Microlearning helps me learn new content quickly without taking up too much time.	2.60	1.23
The short duration of microlearning allows me to engage with content whenever I have a few spare minutes.	3.37	0.99

According to the survey, teacher educators value microlearning for its efficiency in time. Interviewees agreed to somewhat extents that "Microlearning fits easily with our fast-paced work" (mean = 3.13), and the concise blips of microlearning rather compel them to engage swiftly (mean

= 3.37). Nonetheless, the lower average for "helps me learn new content quickly" (mean = 2.60) has indicated microlearning as time efficient in general but its content might not always be considered as timely applicable or effective in learning material delivery.

Table 4: Teacher Educators' Perceptions of Learning Effectiveness and Retention

Statement	Mean	Standard Deviation
I am able to retain information from microlearning sessions more effectively than traditional learning methods.	3.12	1.04
Microlearning helps me understand concepts in a more focused and clear manner.	3.33	1.05
I find that I can easily recall what I have learned from microlearning sessions when applying it in my teaching.	3.34	1.11

The findings demonstrate teacher educators' belief in the utility of microlearning for knowledge retention and comprehension. The average scores indicate moderate to high agreement regarding the efficacy of microlearning in facilitating understanding (mean = 3.33) and recall of content (mean = 3.34). Nonetheless, there is a lower level of consensus that it is more effective than other conventional learning ways (M = 3.12), thus indicating that microlearning is valuable but not the total solution for all teacher educators.

Table 5: Teacher Educators' Perceptions of Accessibility and Flexibility

Statement	Mean	Standard Deviation
I can access microlearning content anytime and from anywhere, which is convenient for me.	3.66	1.17
Microlearning allows me to learn at my own pace, without the pressure of a fixed schedule.	3.06	1.17
The ability to access microlearning content on various devices (e.g., mobile, tablet, computer) enhances my learning experience.	3.52	1.11

The convenience and flexibility of microlearning is widely appreciated by teacher educators. The greatest mean score (3.66) represents high agreement regarding the ability to have content at any time, any place as a major advantage. The possibility of content access using different devices was high (M = 3.52). These findings suggest that flexibility is an important factor supporting within micro learn, where teacher educators can learn content at any time they want.

Table 6: Correlation between microlearning and professional development

Factors	Engagement	Time Efficiency	Learning Retention	Accessibility	CPD
Engagement	1	0.470**	0.392**	0.156*	0.275**
Time Efficiency	0.470**	1	0.582**	0.334**	0.415**
Learning Retention	0.392**	0.582**	1	0.337**	0.506**
Accessibility	0.156*	0.334**	0.337**	1	0.401**

CPD (Continuous PD)	0.275**	0.415**	0.506**	0.401**	1

The correlation analysis indicates that there are significant positive correlations among the micro learning factors and CPD. Both Time Efficiency and Learning Retention are strongly correlated with CPD ($r = 0.415$, $r = 0.506$), indicating that when teacher educators believe microlearning to be efficient in time and effective in learning retention, they will be more likely to engage in CPD. Further, engagement and motivation are modestly associated with CPD ($r = 0.275$). Its lower correlation with Accessibility suggests that there may be some importance in accessibility, but it is not the sole responsible mechanism behind professional growth.

Table 7. Regression Analysis Summary – Impact of Microlearning on Professional Development

Model	**R**	**R Square**	**Adjusted R-Square**	**Std. Error of the Estimate**
Microlearning	0.556	0.309	0.306	0.59199

The regression analysis in the table above demonstrates that microlearning explains a modest but highly significant level (30.6%) of the variation in outcomes associated with professional development. This result shows that even though microlearning is a lever for PD, other factors may support professional development, including institutional, learning situation and personal motivation.

Findings

Considering teacher educators' perceptions and microlearning in their PD, the following findings arise from the study:

1. Teacher educators in Lahore use microlearning to a moderate level. Although not yet mainstream in the tradition of professional development, it is becoming more highly regarded for its customizable format and availability.
2. The flexibility and the easiness to access is highly valued. Teacher educators value it very highly that microlearning seems so flexible, as many participants claimed that accessing learning materials every time from everywhere was a big advantage (mean = 3.66). This also helped in learning better as they could access content through different devices (mean = 3.52).
3. Microlearning was perceived to be motivating because it was short and engaging. Most of the teacher leaders believed that the small amount of time required for microlearning was conducive to completing it (mean=3.49). Engagement was also supported by the wide range of formats used for content (videos, quizzes, infographics) [mean = 3.45].
4. Microlearning was believed to be effective in improving retention of learning. Teacher educators reported that they had perceived a somewhat increased capability for remembering the material in microlearning compared to materials gained in traditional ways (3.12) and more focused and clear learning content (3.33).
5. Teacher educators appreciated that microlearning could be used within their busy schedules. Participants concurred that the time-consuming microlearning period gave them opportunities to interact with content in their free time (mean = 3.37). Agreement was weaker than it would help teachers learn new content more rapidly without cutting into their other allocations of time (mean = 2.60).

6. A statistically significant positive correlations were found for these microlearning factors (ie, engagement, time effectiveness, retention, accessibility) and measures related to professional development. The relationship between microlearning and CPD was found to be significant, with the highest correlation observed for time efficiency (r = 0.415), followed by learning retention (r = 0.506) and engagement (r = 0.275), which suggests the influence of these themes on professional development.

7. Gender and job designation were found to have a significant influence on teacher educators' perception of microlearning. Scores for males (mean = 3.37) were slightly higher on engagement and motivation in microlearning than the scores of females (mean = 3.15). However, time effectiveness, learning effect, and accessibility did not have the gender differences.

8. As for experience and type of university, no significant difference was found in perception about microlearning. Thus, the perception about microlearning's effectiveness as a PD tool is uniform across experience levels and institutional types.

9. The regression analysis further revealed that approximately 30.6 % of the variance in professional development outcomes was described by microlearning, so it can be concluded that, although to a moderate degree, it nonetheless significantly deserves credit for teacher-educators developing professionally through microlearning.

10. Although promising, impediments exist for teacher educators to fully benefit from microlearning. This includes low access to platforms, poor digital literacy and a lack of institutional backing, inhibiting the uptake of microlearning for professional development.

Discussion

The results of the study, conducted on microlearning in the Professional Development (PD) for teacher educators in Lahore, Pakistan, are consistent with and complement recent research work on microlearning's advantages and struggles.

Moderate Utilization of Microlearning

The present study reveals that microlearning is being practiced to a moderate level among teacher educators in Lahore, and they like its flexibility and ease of access. This result reflects the findings of Kohnke and Moorhouse (2021), who also reported that ease of use, compactness and flexibility contributed to Hong Kong teachers' moderate usage of microlearning. Likewise, in Brazil, Silva et al (2025) noted positive reactions to microlearning, with teachers appreciating the small bite-sized nature of learning episodes which they could fit into their existing schedule.

So, the popularity of microlearning is on the rise, its relatively low application in Lahore suggests that it has not quite realized its full potential. Balasundaram et al (2024) similarly argued that microlearning is underexploited in several developing countries and barriers like platform familiarity and digital literacy hinder its full application. These results are in line with the study findings that low awareness regarding microlearning platforms plays a major hindering role in Lahore.

Flexibility and Accessibility

There are three salient features of flexible microlearning based on the lived experience of teacher educators participating in this research: supply teachers can access content when they want, how they please, and on a range of devices. This is consistent with Kohnke and Foung (2023), who alluded to flexibility as one of the paramount benefits of microlearning, therefore rendering it more attractive to time-poor educators. Zhu et al (2024) also highlighted that accessibility is a factor in the effectiveness of microlearning, enabling educators to come into contact with content

when it is convenient for them, thus avoiding traditional PD challenges such as set time slots and geographical issues.

The convenience of microlearning was also highlighted in the study by Davis (2023), who reported that teachers in Brazil valued being able to access PD content on mobile media devices. This is especially shown in developing countries, where constraints exist to access proper forms of PD due to a lack of infrastructure and resources. Hence, this group of teachers appreciates more technical solutions such as microlearning.

Engagement and Motivation

The research shows that microlearning has a strong enticement attribute and motivation power which is also confirmed with previous studies. Kohnke & Moorhouse (2021) argued that microlearning's short length with interactive content (e.g.,   videos, quizzes) ensures longer engagement and favorable learner experiences. In a similar vein, Anis (2024) found microlearning's capability to deliver content in small and manageable chunks that can be easily appropriated contributed significantly to teacher educators' motivation for involving with PD.

Although microlearning was considered engaging in this study, its platform awareness was lower (mean = 2.80),   indicating to some extent a low level of accessibility or marketing to find among teacher educators. Mugahed and Al-Abdi (2025) highlighted the challenge of platform awareness, particularly in regions with limited technology infrastructure. This is a knowledge gap consistent with the research and findings of Monib et al (2025) that insufficient training on microlearning platforms can limit engagement.

Learning Retention

The findings of the desirable effects of microlearning found in this study are consistent with cognitive theories, such as Cognitive Load Theory (Taylor & Hung, 2022), which suggests that brief and focused learning interventions are more effective for memory retention compared to longer traditional training. The research findings that teacher educators could remember material better after microlearning (mean = 3.34) are consistent with research by Kohnke and Moorhouse (2024), who argue that micro learning, which is characterized by very brief duration and content focus, results in better retention of material and recall, especially for individuals who work in speedy paced high demand professions such as teaching.

Furthermore, Khalid (2024) identified that the incorporation of spaced repetition in microlearning sessions can promote retention even more and argues that integrating these techniques into microlearning content can then improve learning effects.

Time Efficiency

Another interesting result of the research is the time-saving benefit of microlearning. Both teacher educators and student respondents valued the "bite-sized" nature of microlearning in that it enabled them to interact with content during short pockets of available time (M = 3.37). This is in line with Zhu & Cheng (2022), who argued that microlearning accommodates teachers' tight schedule, consequently, facilitates PD. Alias (2025) noted that teachers appreciated the learning provision of microlearning, where they had access to content when and as they needed it.

However, unlike previous studies (Kennedy, 2016), this sample of teachers expressed a little less confidence in achieving faster learning gains overall with microlearning's help (mean=2.60), with Kennedy noting that while it is efficient, microlearning may not possess the depth necessary for full skill acquisition across contexts on occasion. This indicates that while microlearning may be suitable for providing short bursts of information, its effectiveness for deeper and/ or complex learning requires further investigation.

Barriers to Full Utilization

The research found that there were challenges to the effective use of microlearning, such as a lack of knowledge of platforms, digital literacy and institutional support. These barriers are consistent with those reported by Mugahed and Al-Abdi (2025), who explored the low digital literacy availability and lack of infrastructure in developing nations as an obstacle to adopt cutting edge PD model like microlearning. Similarly, Batool et al. (2023) discovered that, though microlearning has proven to be effective in domain-specific learning cases such as healthcare education in Pakistan, it is being held back from being integrated into wider pedagogical scenarios due to the abovementioned issues.

Gender and Job Designation Influence

Additionally, gender and profession had an effect on attitudes toward microlearning as males were somewhat more engaged and motivated by microlearning than female participants. This result can be corroborated by Zhu et al (2024) that gender plays same influence on attitudes to digital learning to get involved in technology-mediated PD programs. Further, Kohnke & Moorhouse (2024) identified that higher ranking educators (e.g. professors) appeared to be using micro learning more than other categories of academics as they were more likely to have illustrations in the use of digital tools. On the other hand, differences were not found for years of experience and university type (public or private), which means that the advantages from microlearning are not highly dependent on these factors, as shown by Silva etal (2025) in their research.

Microlearning's Contribution to Professional Development

The results of the regression show that microlearning accounts for 30% in all variations (Adjusted $R^2 = 0.306$)." This is consistent with previous studies by Kohnke & Foung (2023) and Alias (2025). They also indicated that microlearning has helped develop teachers professionally, increasing their confidence, self-efficacy and teaching quality. However, the residual variance indicates that other elements—such as support from one's institution, intrinsic motivation and access to resources—are also important factors for the effectiveness of a PD program.

Conclusion of the Study

While teacher educators are using little microlearning in the microlearning course, it was generally recognized that this type of learning provides flexibility and convenience, which are both important when an educator is busy. Pedagogical utility was most attributed to flexibility – learning at one's own pace, on any device. For learning retention, respondents found microlearning resources to help learn how teacher educators remember more of what they learned (and were trained on) - being able to include information into their day-to-day operations naturally. The correlations between microlearning and professional development results are statistically significant, demonstrating that microlearning enhances continuing teacher educator development as related to quality teaching practice and skills. The full exploitation of microlearning could be limited by various barriers like a low level of platform awareness, digital literacy problem and the lack of institutional support. As per the study, gender and job role affected perceptions towards microlearning. Male teacher educators and those in higher positions (e.g., professors) were found to be more engaged and motivated for microlearning. The results of the regression analysis also indicated that microlearning accounts for about 30% of the variance in professional development effectiveness, demonstrating a moderate but significant effect on the professional development of teacher educators. This indicates that maturity and support at all levels, incl. personal initiative/motivation (teacher influence) as well as access to resources provided by the institutions,

can play key roles in the success of PD initiatives beyond the microlearning sessions by themselves.

Implications for Policy and Practice

The findings of this study have a few important implications for Pakistani academic policy and practice:

1. Based on the advantages of microlearning for teacher educators, it can also provide time-effective options which go beyond existing traditional models of PD.
2. To improve microlearning adoption rates, colleges should invest in digital infrastructure, promote the platform and offer training to enhance teacher educators' digital literacy.
3. The content should be localized, customized and contextualized to match the local needs of Pakistani Education faculty.
4. Study needs further research to investigate the long-term impact of micro learning on teacher educators' teaching and student achievement.
5. Empirical studies may investigate the use of microlearning in specific areas (rural, subject) to know whether this is applicable at a more general level.

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