Teacher Education MOOCs: Engagement and Experiences of Pre-service Teachers

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ABSTRACT

MOOCs (Massive Open Online Courses) are a relatively new trend in the field of education. They are gaining popularity day by day all over the world. These online courses can contribute significantly to teachers' education and professional development. In line with this, the present study aims to investigate pre-service teachers' engagement in MOOCs and their experiences with learning through MOOCs. The participants of this study included 200 pre-service teachers from different teacher education institutions in India who have participated in at least one teacher education MOOC. The researchers developed a questionnaire and used the snowball sampling technique to gather data from pre-service teachers. The findings of this study will be relevant to policymakers, educators, and researchers interested in enhancing the quality and accessibility of teacher education programs. The study will also be of interest to pre-service teachers who are considering participating in MOOCs for their professional development.
Keywords*: Massive open online courses, MOOCs, online learning, teacher education, pre-service teachers, teacher professional development

INTRODUCTION

Massive Open Online Courses are online courses that are designed to be accessible to anyone, anywhere in the world, and can accommodate an unlimited number of participants. According to Zhu et al. (2020), MOOCs and traditional online courses differ in terms of their accessibility and fee structure. Unlike traditional online courses, MOOCs are open access to all potential learners and do not typically charge registration fees for learners who do not intend to obtain a certificate.

MOOCs offer a range of benefits, such as flexibility, free-of-charge access, and the ability to learn at one's own pace. These features make MOOCs an attractive option for pre-service teachers who may face time and financial constraints while pursuing their education. Moreover, MOOCs offer opportunities for pre-service teachers to interact and collaborate with educators and other learners from all over the world, promoting cross-cultural exchange and sharing of best practices. According to Gómez-Galán et al. (2020), pre-service teachers view MOOC courses as valuable teaching models in socio-educational contexts due to their advantages such as free usage, accessibility to disadvantaged groups, and flexible scheduling. However, these courses also have significant drawbacks. The authors note that the lack of adequate follow-up on the student, uninspired course materials, and inadequate evaluation of learning are all major issues with MOOCs. Notably, the primary concerns identified were pedagogical, rather than technical.

Misra (2018) highlighted the significance of MOOCs as they have emerged as a cost-effective and convenient way to supplement traditional methods of teacher professional development. The study claims that the widespread enthusiasm for MOOCs in the education community is based on the belief that they can provide mass training to teachers across different cultures and languages. These courses can offer teachers access to a variety of high-quality educational resources that can be used to enhance their teaching skills and keep them up-to-date with the latest developments in education (Misra, 2018).

Greene et al., (2015) suggest that teachers may have a higher chance of continuing with, completing, and succeeding in MOOCs. However, Hodges et al., (2016) emphasised that designers need to make intentional design decisions to accommodate observed needs of teachers in MOOC-based professional development experiences.

A study conducted by Koukis and Jimoyiannis (2017) focused on the use of pdMOOC (professional development Massive Open Online Course) created for language teachers, with the objective of enhancing their understanding

and capabilities in incorporating particular Web 2.0 tools into their teaching practices. The study employed both qualitative and descriptive analysis, which demonstrated the potential of MOOCs in promoting teacher engagement and collaboration while also offering improved opportunities for their professional development in a non-formal setting.

Sezgin (2020) explored the views and experiences of both pre-service teachers and teacher trainers regarding the integration of MOOCs in teacher education. It was found that despite a lack of awareness or exposure to MOOCs, the majority of pre-service teachers and teacher trainers perceive them to be beneficial for professional development. Based on the findings, it was claimed that the participants had a positive attitude towards the use of MOOCs in teacher education.

Research on teacher professional development also suggests that equipping pre-service teachers with a diverse range of pedagogical knowledge prior to entering the classroom can enhance their ability to adapt to dynamic and rapidly changing learning environments (Batchelor & Lautenbach, 2015). Using MOOCs into the educational and professional development of teachers can provide a continuous, efficient, and affordable way to improve their skills. Additionally, it allows teachers to keep themselves up-to-date with evolving educational technologies, which is supported by the technology-based structure of MOOCs (Sezgin, 2020).

Donitsa-Schmidt et al. (2020) explored pre-service teachers' perceptions of the use and contribution of MOOCs in initial teacher education programmes, particularly during the COVID-19 pandemic. They found that pre-service teachers who study more MOOCs believed that these courses would positively impact their future teaching. They also recognized the significance of MOOCs during times of crisis and advocated for a higher proportion of MOOCs to be included in initial teacher education programmes.

After reviewing different researches, it was realized that it is important to gain insight into the effectiveness of MOOCs in teacher education and the challenges faced by pre-service teachers while learning through these open courses. Analyzing pre-service teachers' engagement in MOOCs and examining their experiences can provide valuable information on the suitability of MOOCs for teacher education. Investigating the educational value of MOOCs as perceived by pre-service teachers in learning through MOOCs can help in understanding the potential of MOOCs in enhancing teacher professional development. Also, identifying the challenges faced by pre-service teachers in learning through MOOCs can provide useful insights into the limitations of these courses and suggest ways to overcome them.

The objectives of this study are as follows:
1. To analyse pre-service teachers' engagement in MOOCs
2. To examine the experiences of pre-service teachers while learning through MOOCs
3. To investigate MOOCs' educational value, as perceived by pre-service teachers
4. To find out the challenges faced by pre-service teachers in learning through MOOCs

METHODS AND MATERIALS
This section includes information about research design, participants, data collection tool, data collection procedure and analysis.

Research Design
Quantitative research design was used in this study.

Participants
The participants of this study included 200 pre-service teachers from different Teacher Education Institutions pan-India, who have participated in at least one Teacher Education MOOC (irrespective of course completion). The snowball sampling technique was used to collect data from pre-service teachers.

Tools and Techniques
A questionnaire was developed to collect data from pre-service teachers who have participated in one or more MOOC related to Teacher Education. The questionnaire was divided into 4 sections: demographic information of the participants, engagement and experiences with MOOCs, educational value of MOOCs and challenges in learning through MOOCs.

Procedure of Data Collection
The data was gathered from pre-service teachers through snowball sampling technique. A Google form was created to collect the data and the link was shared to some of the identified MOOC participants. They were further asked

to share the details of other MOOC participants who have participated in one or more Teacher Education MOOC. In total, 207 responses were received, of which 200 were usable. The survey was carried out for 6 months..

Analysis of the Data
The quantitative data obtained were entered and tabulated into MS Excel sheet for data analysis procedure. The percentage and frequency count was calculated for each item of the questionnaire.

RESULTS
Pre-service teachers were asked about their demographic information, their engagement and experience with MOOCs, their perception about MOOCs' educational value and the challenges they face while learning through MOOCs.

Demographic information
The study collected data from both male and female pre-service teachers about their experiences of participating in MOOCs. The findings show that 56.5% of the respondents were female and 43.5% were male, as illustrated in Figure 1. This indicates that both genders were represented in the study and provides insight into the experiences of both male and female pre-service teachers in MOOCs.
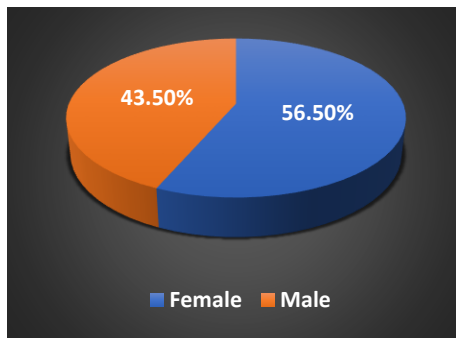

Figure 1: Gender of the participants

A majority of the participants in this study were under 25 years old, comprising 67.5% of the total sample. Meanwhile, 23% of the participants were between the ages of 25 and 30, and the remaining 9.5% were over 30 years old. This suggests that MOOCs may be more popular among younger individuals who are seeking flexible and easily accessible learning opportunities. Also this segment of the population has more risk taking ability and a desire to try new technologies.
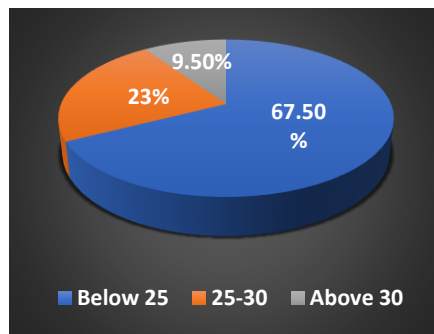

Figure 2: Age of the participants (in years)

Figure 3 shows that a significant proportion of the pre-service teachers who participated in the MOOCs were enrolled in private universities (more than half of them), while around one-third of them were enrolled in central universities and the rest were from state universities. This could imply that private university students are more inclined to use MOOCs as a means of accessing professional development opportunities.
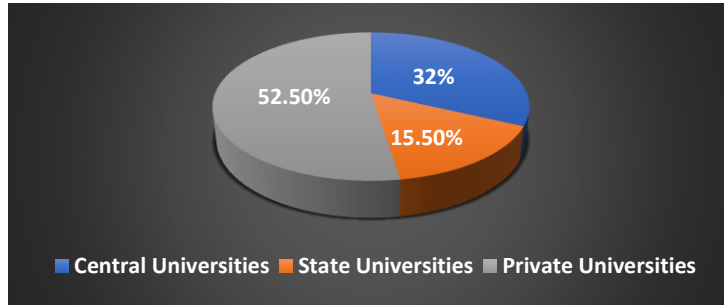
Figure 3: Type of universities the pre-service teachers were enrolled in

Engagement of pre-teachers in MOOC(s)
The pre-service teachers were asked to indicate the current level of their course. The responses are illustrated in Figure 4.
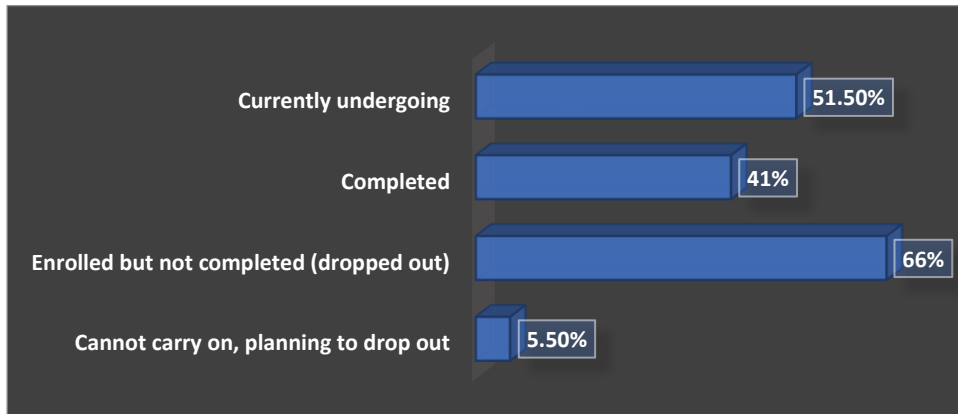

Figure 4: Current level of pre-service teachers' course(s)

The findings of the study revealed that a significant proportion of pre-service teachers who initially enrolled in MOOCs ended up dropping out, with 66% of them reporting this outcome. This suggests that there may be some challenges or barriers that prevent pre-service teachers from completing MOOCs. Additionally, more than half of the pre-service teachers (51.5%) reported that their course was still ongoing at the time of data collection. Of those who had completed one or more MOOCs, 41% of sample reported doing so. However, a small proportion (5.5%) of pre-service teachers indicated that they were unable to continue with the course and intended to drop out. The pre-service teachers reported using a variety of MOOC platforms, including Coursera, EdX, SWAYAM, Udemy, Canvas Network, and Future The use of various platforms to access MOOCs for their personal learning or professional development by pre-service teachers implies that the realm of education is endowed with diverse options and platforms for online learning.
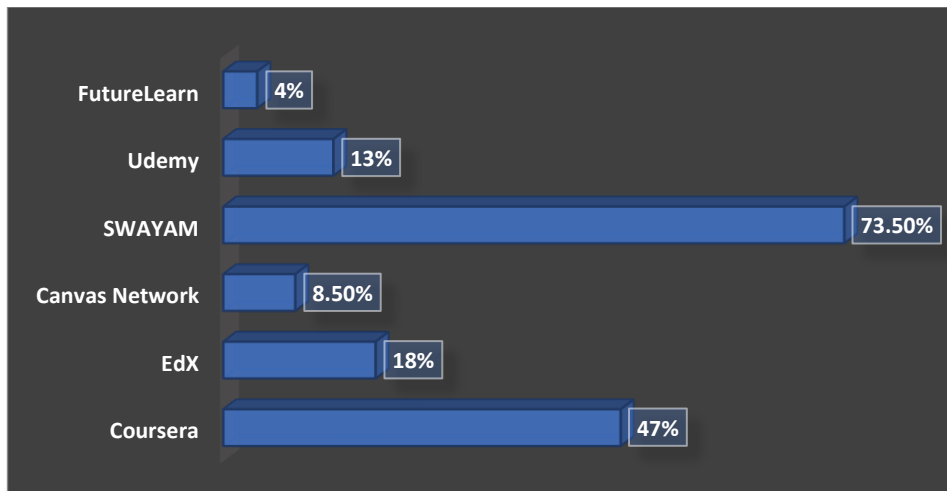

Figure 5: MOOC platforms used by pre-service teachers

From Figure 5, it was found that SWAYAM was the most popular MOOC platform among the pre-service teachers, with 73.5% of respondents reporting enrolment in courses offered through this platform. Coursera was the second most commonly used platform, with 47% of pre-service teachers enrolled in courses through this platform. EdX was used by 18% of pre-service teachers, while Udemy was used by 13%, the Canvas Network by 8.5%, and Future Learn by 4%.

In Figure 6, the responses of pre-service teachers regarding the number of hours they allocate to learning through MOOCs per week are presented.
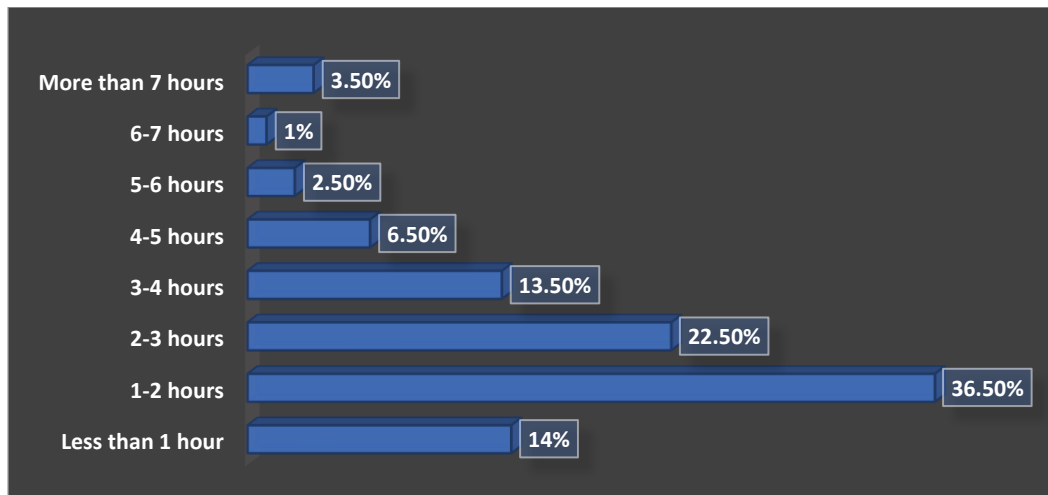

Figure 6: Number of hours allocated to learning through MOOCs per week

The findings suggest that the majority of the pre-service teachers spent 1-3 hours (59%) per week on MOOCs. On the other hand, a smaller percentage of pre-service teachers (less than 5%) reported spending more than 6 hours per week on MOOCs, indicating a higher level of engagement and dedication to the course. However, it is notable that 14% pre-service teachers reported spending less than an hour per week on MOOCs, which may indicate a lower level of commitment or engagement with the online courses.

Figure 7 presents the findings of the pre-service teachers' frequency of completing assigned tasks in MOOCs.
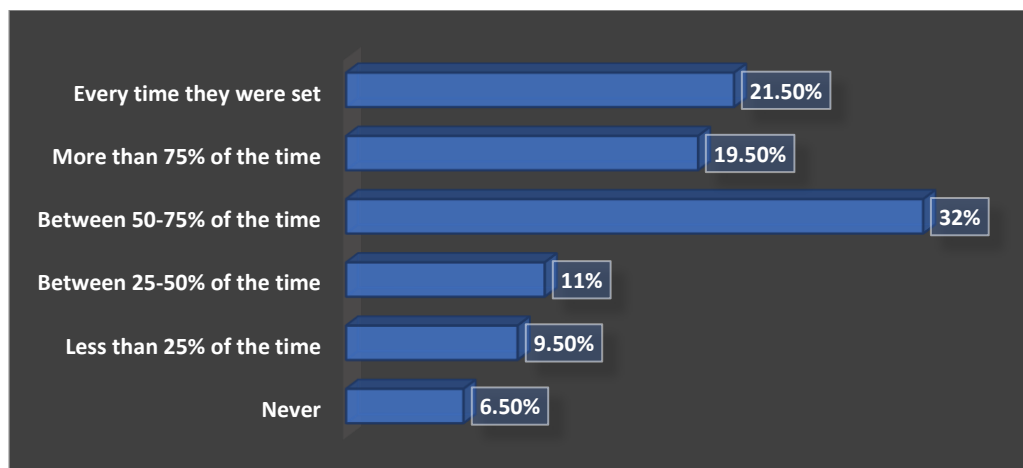

Figure 7: Frequency of completing the assigned tasks in MOOCs

The study revealed that 21.5% of pre-service teachers reported completing the assigned tasks every time, while 19.5% completed them more than 75% of the time. In addition, 32% of the sample completed the assigned tasks between 50 and 75% of the time, whereas 11% completed them between 25 and 50% of the time. Notably, 9.5% of pre-service teachers reported completing assigned tasks less than 25% of the time, and 6.5% never completed them. These findings highlight the variability in task completion rates among pre-service teachers in MOOCs, with a notable percentage of them struggling to consistently complete the assigned tasks.

The pre-service teachers were also asked about their engagement level with the course content in MOOCs. Figure 8 illustrates the responses of the participants.
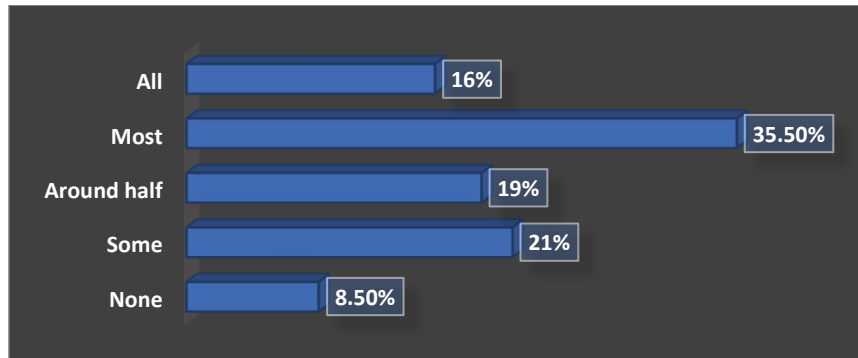

Figure 8: Course content watched or read as compared to the total course length

The findings suggest that a majority of pre-service teachers did not complete the entire course content, with only 16% reporting that they watched or read the entire content. On the other hand, 35.5% reported watching or reading most of the content, while 19% and 21% watched or read about half and some of the content, respectively. However, a small proportion of pre-service teachers (8.5%) indicated that they did not watch or read any course content at all. These findings suggest that while MOOCs provide a flexible learning experience, the learners' level of engagement with the course content may vary, with some learners not completing the course content.
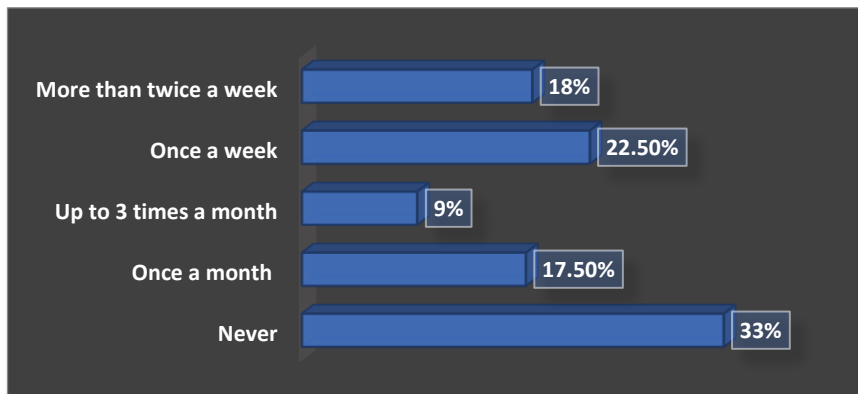

Figure 9: Participation frequency of pre-service teachers in the discussion forum

To gather insights into the participation of pre-service teachers in MOOC discussion forums, they were asked about the frequency of their participation. Figure 9 reveals that a small percentage (18%) of pre-service teachers engaged more than twice a week, while a larger percentage (22.5%) engaged once a week. Additionally, 33% reported that they never participated in discussion forums. The findings also showed that 9% of pre-service teachers participated up to three times a month. Therefore, it was found that the frequency of participation in MOOC discussion forums varied among the pre-service teachers, with a considerable number of them (33%) reporting no participation at all.

MOOC Experiences
The pre-service teachers were also asked about the quality of the course materials provided in the MOOC(s) they attended, and the findings, shown in Figure 10, indicate that a majority of them agreed that the quality of course content was good. Specifically, 40% strongly agreed, while 48% agreed with the statement. Only a small proportion of pre-service teachers were unsure (8%) or disagreed (3.5%). This suggests that, overall, the pre-service teachers had a positive perception of the quality of the course materials provided in the MOOC(s) they attended.
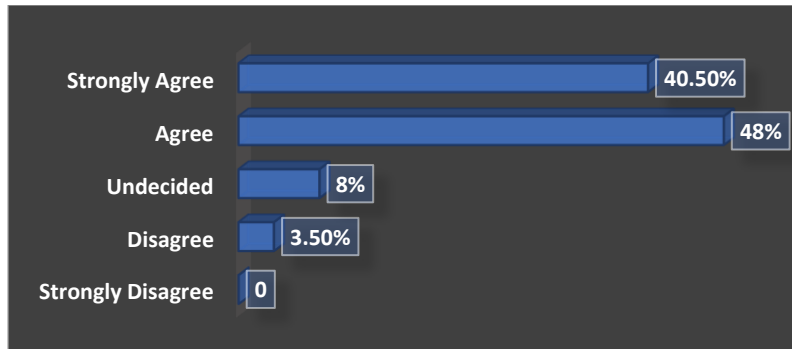
Figure 10: Responses of pre-service teachers to the statement "The quality of the course content was good"

The pre-service teachers were asked about the ease of understanding the course content provided in the MOOC(s) they attended. The results are presented in Figure 11.
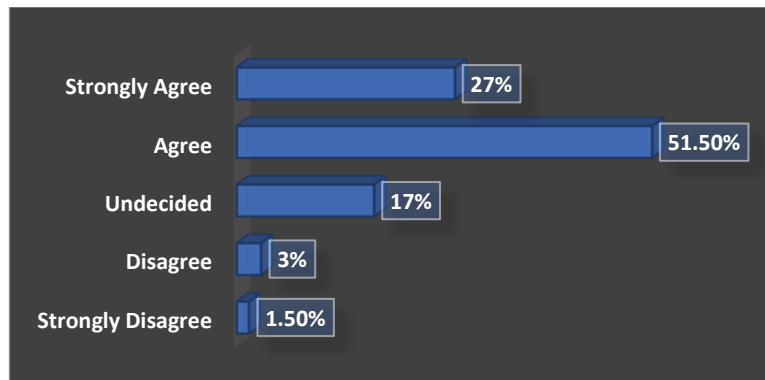

Figure 11: Responses of pre-service teachers to the statement "The course content was easy to understand"

Findings revealed that over half of the pre-service teachers who participated in the survey found the course content to be easy to understand. Specifically, 51.5% of the respondents agreed with this statement, with 27% strongly agreeing. However, there were some who were unsure (17%) and some who disagreed (4.5%). Only 1.5% of the respondents strongly disagreed. This indicates that the majority of the pre-service teachers found the MOOC content to be easy to understand.

Figure 12 shows the responses of pre-service teachers when asked about the adequacy of information on MOOC platforms.
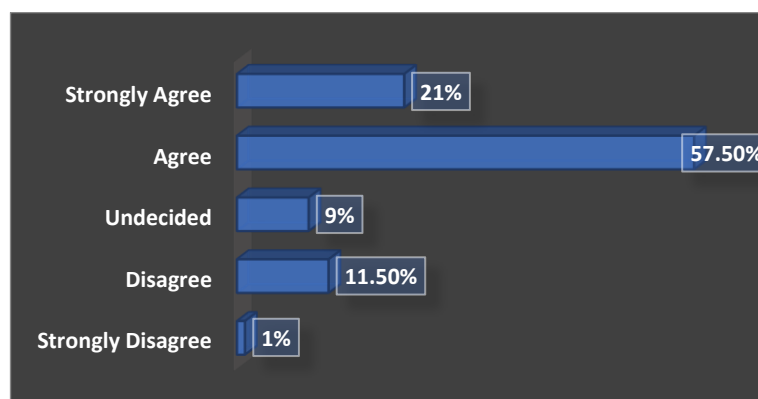

Figure 12: Responses of pre-service teachers to the statement "The amount of information on the MOOC platform was adequate"

The findings show that the majority of pre-service teachers agreed that the amount of information on MOOC platform was adequate, with 21% strongly agreeing and 57.5% agreeing. However, 9% of pre-service teachers were unsure, while 12.5% disagreed, with 1% strongly disagreeing and 11.5% disagreeing. These findings suggest that a significant proportion of pre-service teachers perceive the amount of information provided on the MOOC platform to be inadequate, which may have implications for their learning experience and outcomes. Therefore, it

may be important for MOOC providers to ensure that the information provided on their platforms is adequate and easy to navigate to facilitate the learning process for all learners.

Next, the pre-service teachers were asked if they felt they received sufficient support from their MOOC instructor or technical support. The results, presented in Figure 13, show that 67% of the pre-service teachers agreed or strongly agreed with the statement. However, 17% of respondents were uncertain and 17% either disagreed or strongly disagreed with the statement, indicating that there may be room for improvement in terms of the support provided to MOOC learners.
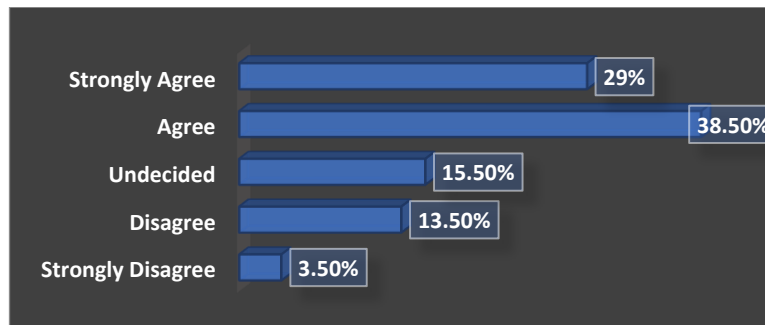

Figure 13: Responses of pre-service teachers to the statement "I received adequate support from my MOOC instructors or technical support"

The pre-service teachers were asked whether they felt that their questions were always addressed by MOOC instructors. The results, as displayed in Figure 14, indicate that a majority of pre-service teachers (66.5%) agreed with the statement, with 18% strongly agreeing and 48.5% agreeing. While 23% were uncertain, 10.5% of pre-service teachers disagreed, with 4% strongly disagreeing and 6.5% disagreeing. Overall, it seems that a majority of pre-service teachers felt their questions were addressed, but a significant proportion still expressed uncertainty or disagreement with the statement.
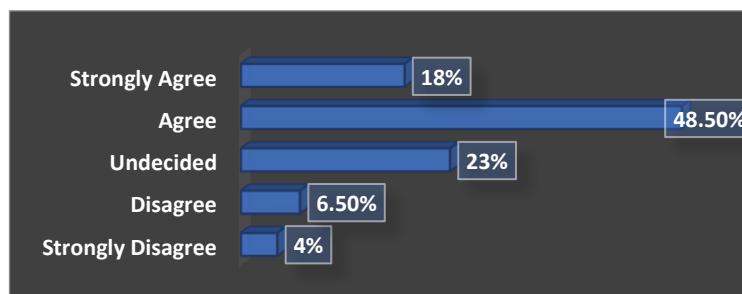

Figure 14: Responses of pre-service teachers to the statement "My queries were answered by MOOC instructors whenever I raised one"

MOOC Educational Value
The pre-service teachers were asked several questions related to the educational value of MOOCs (Figure 15), and their responses shed light on some interesting insights. Firstly when asked about the main reasons for enrolling in a MOOC, all pre-service teachers agreed that the ability to learn at their own pace was one of the primary motivators. This suggests that the flexibility offered by MOOCs is highly valued by pre-service teachers, who may have other demands on their time and schedule.
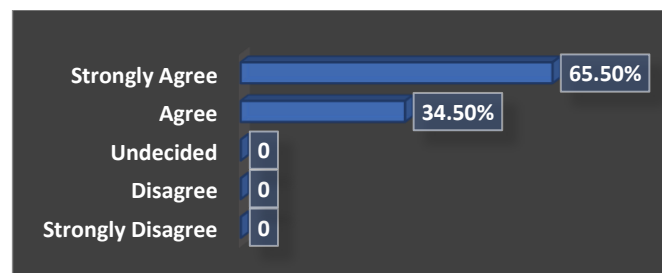

Figure 15: Responses of pre-service teachers to the statement "Learning at my own pace was one of the main reasons for me to join a MOOC"

In terms of professional development (Figure 16), around 70% of pre-service teachers agreed that learning through MOOCs had benefitted them in this area. This is a positive sign and suggests that MOOCs can be an effective tool for promoting personal growth and development.
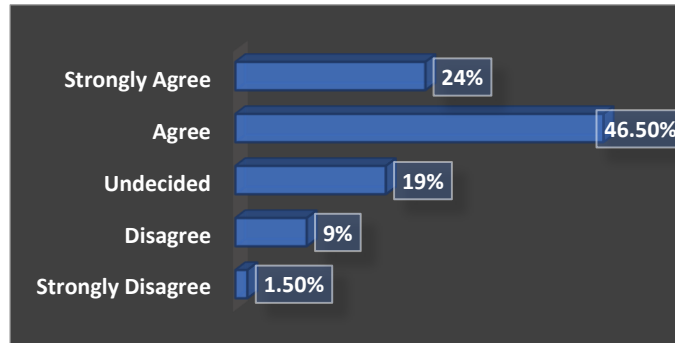

Figure 16: Pre-service teachers' responses to the statement "Learning through MOOCs has benefited my personal development"

When asked if taking a MOOC allowed them to attend a course they would otherwise have missed, around 80% of pre-service teachers agreed (Figure 17). This indicates that MOOCs have the potential to increase access to education and help bridge the gap for those who may not have the opportunity to attend certain courses due to various reasons.
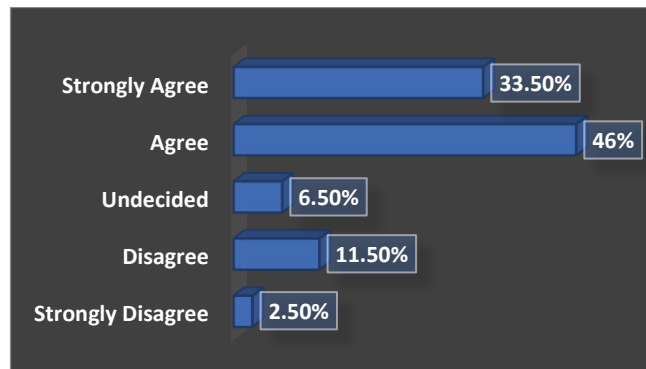

Figure 17: Responses of pre-service teachers to the statement "Taking a MOOC allowed me to take a course I would otherwise have missed"

Furthermore, the pre-service teachers were asked if those courses would be beneficial for teachers' learning and professional development. Their responses are depicted in Figure 18.
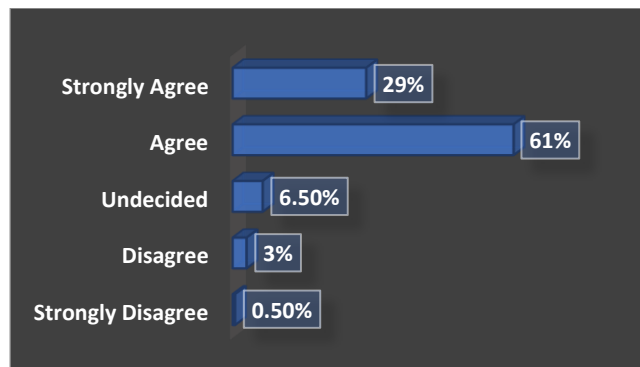
Figure 18: Responses of pre-service teachers to the statement "These courses would be beneficial for teachers' learning and professional development"

The results indicate that a significant majority of the respondents believed that MOOCs would be beneficial for teachers. Specifically, 29% strongly agreed, while 61% agreed with the statement. Only a small proportion of the pre-service teachers were unsure (6.5%), disagreed (3%), or strongly disagreed (0.5%). This suggests that pre-service teachers perceive MOOCs as a valuable tool for their professional development. This is an important

finding as it highlights the potential of MOOCs in addressing the ongoing professional development needs of teachers, especially given the ever-changing nature of education and the need for teachers to keep up with new teaching methods and practices. The high levels of agreement also indicate that MOOCs could be an effective strategy for addressing the challenges of continuing professional development for teachers, especially in contexts where access to traditional professional development may be limited.

They were also asked whether the advantages of taking a MOOC outweighed the disadvantages. The findings are shown in Figure 19.
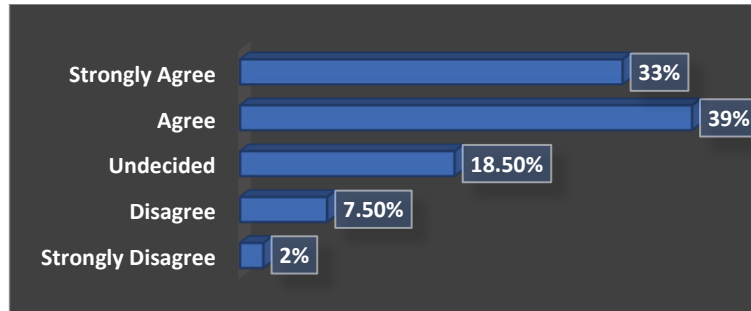
Figure 19: Responses of pre-service teachers to the statement "The advantages of taking a MOOC outweighed the disadvantages"

It was found that a majority of pre-service teachers believed that the advantages of taking a MOOC outweigh the disadvantages (33% strongly agreed and 39% agreed). However, 18.5% of pre-service teachers were unsure on this statement. On the other hand, 7.5% pre-service teachers disagreed and 2% strongly disagreed that the advantages of MOOCs were greater than the disadvantages. This suggests that pre-service teachers perceive benefits of MOOCs as significant and valuable, which could encourage the adoption of MOOCs as a learning tool in teacher education.

Challenges while learning through MOOCs
The pre-service teachers reported the challenges they faced while learning through MOOCs. Findings are shown in Figure 20.

Figure 20: Challenges of learning through MOOCs, as perceived by pre-service teachers

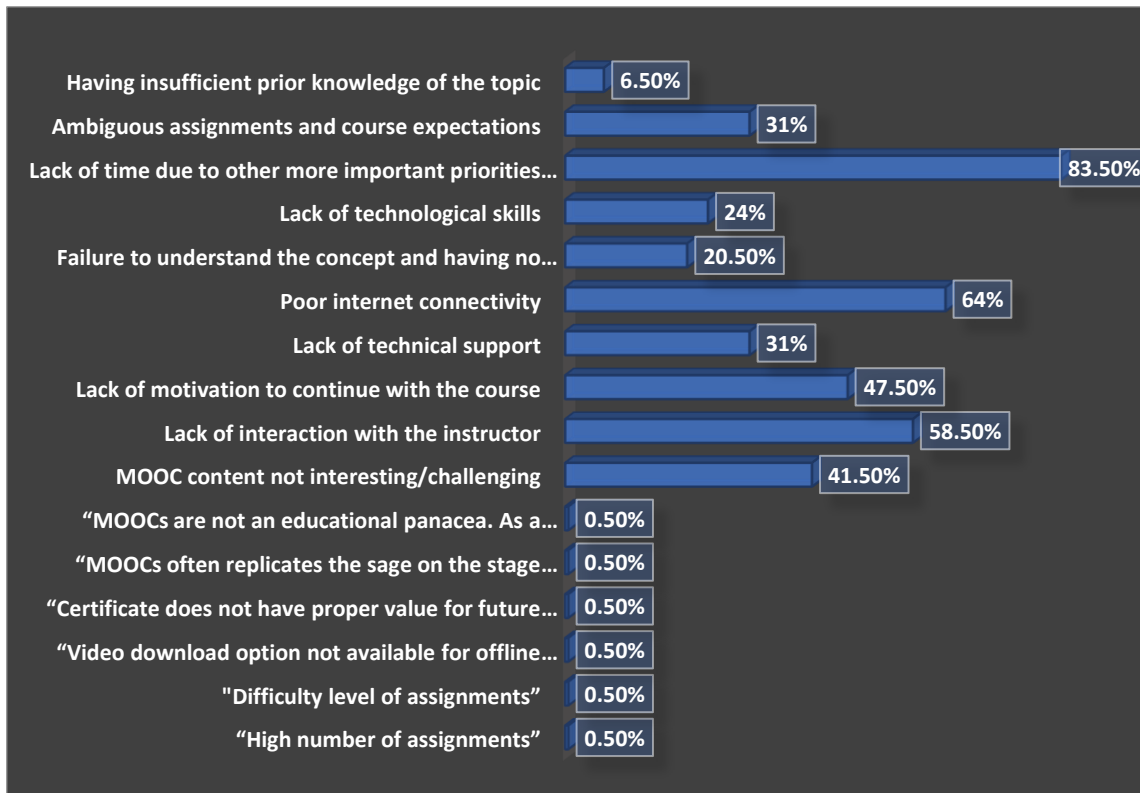The findings of this study showed that pre-service teachers faced various challenges while taking MOOCs. The most significant problem was not having enough time due to other commitments and priorities, which was reported by 83.5% of pre-service teachers. This indicates that the flexibility of MOOCs, allowing learners to take courses at their own pace, might not always be sufficient to overcome learners' time constraints. Another significant challenge was bad internet connections, which affected 64% of pre-service teachers. This highlights the importance of reliable and high-speed internet connectivity for successful MOOC participation.

The lack of interaction with MOOC instructors was also a significant challenge reported by 58.5% of pre-service teachers. This indicates that learners need a certain level of engagement and support from the instructor to stay motivated and engaged in the course. Other challenges reported included lack of motivation to continue with the course (47.5%), uninteresting or unchallenging MOOC content (41.5%), and ambiguous assignments and course expectations (31%). The lack of technical support and technological skills were also reported as challenges by 31% and 24% of pre-service teachers, respectively.

Additionally, some pre-service teachers reported other challenges, such as difficulty in building a relationship with the instructor, lack of effective instructional design, the certificate's lack of value for future usage, no video download option for offline study, and the high difficulty level and number of assignments. These findings indicate that while MOOCs offer a flexible and accessible mode of learning, learners may face various challenges that need to be addressed to enhance their learning experience.

DISCUSSION
The study found that the majority of pre-service teachers enrolled in MOOCs were under 25 years old, which suggests that MOOCs may be more popular among younger individuals who are seeking flexible and easily accessible learning opportunities. Moreover, private university students are more inclined to use MOOCs as a means of accessing professional development opportunities.

The finding that a significant proportion of pre-service teachers who initially enrolled in MOOCs ended up dropping out is consistent with the findings of Erikson et al., 2017; Narayanasamy & Elci, 2020; Dalipi et al., 2018. This may be due to a variety of factors, including the lack of personal interaction and support in MOOCs, as well as the absence of accountability measures to keep learners motivated and on track (Dalipi et al., 2018; Goopio & Cheung, 2020).

The study found that pre-service teachers used a variety of MOOC platforms, including Coursera, EdX, SWAYAM, Udemy, Canvas Network, and Future Learn. This suggests that pre-service teachers are using different platforms to access MOOCs for their professional development or personal learning, which highlights the diversity in platforms and options available for online learning in the field of education. The finding that SWAYAM was the most popular MOOC platform among the pre-service teachers is interesting, as this platform is specific to India and is mostly targeted towards Indian learners. This findings suggest that MOOC platforms that are tailored to specific countries or regions may be more effective in engaging learners and meeting their needs.

The majority of the pre-service teachers spent 1-3 hours per week on MOOCs, indicating that MOOCs provide a flexible learning experience for learners who may not have time for traditional classroom learning. However, a smaller percentage of pre-service teachers reported spending more than 6 hours per week on MOOCs, indicating a higher level of engagement and dedication to the course.

The findings also suggest that a majority of pre-service teachers did not complete the entire course content, with only 16% reporting that they watched or read the entire content. This highlights the importance of designing MOOCs that cater to the diverse learning needs and preferences of the learners. One possible solution to this issue is to offer more interactive and engaging course content that can enhance learners' motivation and interest in the course. Additionally, the use of gamification techniques, such as leader boards and badges, could also incentivize learners to complete the course content and actively participate in the course. Antonaci et al. (2018) and Klemke et al. (2018) suggests that gamification has the potential to foster social interactions among both instructors and learners, as well as learners themselves. These social interactions are important for creating a sense of community and promoting student retention within a course.

Another key finding of the study is related to the engagement of pre-service teachers in MOOC discussion forums. The results indicate that a small percentage (18%) of pre-service teachers engaged more than twice a week, while a larger percentage (22.5%) engaged once a week. Moreover, 33% of pre-service teachers reported that they never participated in the discussion forums, while 26% engaged a few times a month. These findings suggest that there is a need to improve the design of MOOC discussion forums to increase learners' engagement and participation in

these forums. One possible solution is to encourage learners to actively participate in the forums by assigning tasks and providing feedback on their posts. In addition, the use of moderators and facilitators in the discussion forums could also enhance learners' engagement and promote a collaborative learning environment.

It was found that pre-service teachers had positive perceptions of the quality of course materials provided in the MOOC(s) they attended, with a majority agreeing that the content was good and easy to understand. However, there were some who expressed uncertainty or disagreement with these statements, suggesting that there may be room for improvement in. terms of the quality and clarity of the course materials provided. Furthermore, while a majority of pre-service teachers agreed that the amount of information on MOOC platforms was adequate, a significant proportion expressed uncertainty or disagreement with this statement. This may have implications for their learning experience and outcomes, as learners may struggle to navigate the platform or find the information they need to successfully compete the course.

While a majority of pre-service teachers agreed that they received sufficient support from their MOOC instructor or technical support, a significant proportion expressed uncertainty or disagreement with this statement. This suggests that there may be room for improvement in terms of the support provided to MOOC learners, which could ultimately impact their engagement and success in the course. Also, while a majority of pre-service teachers felt that their questions were addressed by MOOC instructors, a significant proportion still expressed uncertainty or disagreement with this statement. This highlights the importance of ensuring that MOOC instructors are responsive to learners' questions and concerns, which can contribute to a positive learning experience and ultimately impact learners' success in the course.

The results suggest that pre-service teachers highly value the flexibility offered by MOOCs, as it allows them to learn at their own pace and accommodate other demands on their time and schedule. This is an important consideration, as it suggests that MOOCs can help address the challenges of balancing professional development with other commitments. The results also suggest that MOOCs can be an effective tool for promoting personal growth and development, as around 70% of pre-service teachers agreed that they had benefitted from learning through MOOCs in terms of professional development. Moreover, the majority of pre-service teachers believed that MOOCs would be beneficial for teachers, highlighting the potential of MOOCs in addressing the ongoing professional development needs of teachers.

Another interesting finding is that the majority of pre-service teachers believed that the advantages of taking a MOOC outweighed the disadvantages. This suggests that pre-service teachers perceive MOOCs as a valuable tool for their learning and professional development, which could encourage the adoption of MOOCs in teacher education. The findings are consistent with Gómez-Galán et al. (2020).

Furthermore, this study shed light on the challenges faced by pre-service teachers while taking MOOCs, which can help identify areas for improvement and enhance the overall effectiveness of MOOCs as a tool for teacher education. The most significant challenge reported by pre-service teachers was not having enough time due to other commitments and priorities, which suggests that the flexibility offered by MOOCs might not always be enough to overcome learners' time constraints. This highlights the need for MOOC designers to consider the time demands of their courses and provide more flexible learning options to accommodate learners' schedules. Another important challenge reported by pre-service teachers was bad internet connections, which can significantly affect their ability to participate in MOOCs. This highlights the need for reliable and high-speed internet connectivity, especially for learners in remote areas or with limited access to technology. Lack of interaction with MOOC instructors was also reported as a significant challenge, indicating that learners need support and engagement from their instructors to stay motivated and engaged in the course. The findings are consistent with Khalil & Ebner (2014) which pointed out crucial factors for high dropout rate in MOOCs including lack of time and the lack of interactivity in MOOCs.

Pre-service teachers also reported challenges related to motivation, course content, and assignments. To address these challenges, MOOC designers should focus on designing courses that are engaging, challenging, and relevant to learners' needs and interests. Providing technical support and clear instructions and expectations can help learners navigate the course more effectively.

CONCLUSION
This study provides valuable insights into the experiences of pre-service teachers in MOOCs, highlighting both strengths and challenges associated with this mode of learning. The findings suggest that MOOCs provide a flexible and easily accessible learning opportunity for pre-service teachers. The study also revealed challenges that need to be addressed to enhance effectiveness of MOOCs for pre-service teacher education. The variability in task

completion rates and frequency of participation in discussion forums highlights the importance of engagement and support for MOOC learners. Nonetheless, the high level of agreement among pre-service teachers regarding the benefits of MOOCs and their value for professional development suggests that MOOCs have the potential to address ongoing professional development needs, particularly in contexts where access to traditional professional development may be limited. Therefore, it can be concluded that MOOCs have the potential to increase access to education, promote personal growth and development, and enhance the professional development of pre-service teachers.

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