

Online Professional Courses' Impact on Teaching and Personal Growth

Cours Professionnels en Ligne et Leur Impact sur l'Enseignement et le Développement Personnel

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Abstract

Online professional courses (OPCs) offer educators a flexible way to enhance their expertise and maintain teaching standards. The current study evaluates the significant role of OPCs in the professional lives of educators by analysing 62 participant responses obtained via an online survey. A notable proportion of 58.1% accessed OPCs through MOOC platforms, with 74.2% favouring subject-specific content. The motivators for OPC participation included professional development requirements, technological skill acquisition, teaching improvements, and personal growth. Post-OPC, educators reported substantial enhancements in topic delivery, technology utilization, and student engagement. Furthermore, chi-square tests of independence and Fisher's exact tests revealed notable improvements in soft skills, including a stronger growth mindset, increased confidence, enhanced problem-solving, greater adaptability, improved time management, and better communication. A significant association ($p < .05$) was observed between educators prioritizing teaching skills and trend awareness, and improved student engagement, adaptability, and problem-solving abilities. Participants who completed more OPCs demonstrated greater enthusiasm for self-directed learning and more effective topic delivery. The findings underscore the crucial role of OPCs in fostering educator development. The findings in this study suggest that the accessibility of self-paced, affordable online modules could encourage broader participation and contribute to improvements in teaching quality.

Keywords: MOOCs, online courses, professional development, soft skills, student engagement, teaching skills

Résumé

Les cours de développement professionnel en ligne (CDPL) offrent aux enseignants une manière flexible de renforcer leurs compétences et de maintenir des standards d'enseignement élevés. La présente étude évalue le rôle significatif des CDPL dans la vie professionnelle des enseignants à partir de l'analyse de 62 réponses recueillies via une enquête en ligne. Une proportion notable de 58,1 % a accédé aux CDPL par le biais de plateformes MOOC, avec 74,2 % privilégiant les contenus spécifiques à leur discipline. Les principaux facteurs de motivation à la participation aux CDPL incluent les exigences de développement professionnel, l'acquisition de compétences technologiques, l'amélioration de l'enseignement et la croissance personnelle. Après avoir suivi ces cours, les enseignants ont signalé des améliorations substantielles dans la transmission des sujets, l'utilisation des technologies et l'engagement des étudiants. De plus, les tests d'indépendance du chi carré et les tests exacts de Fisher ont révélé des améliorations notables des compétences transversales, notamment un état d'esprit axé sur la progression, une confiance accrue, une meilleure résolution de problèmes, une plus grande adaptabilité, une meilleure gestion du temps et une communication améliorée. Une association significative ($p < ,05$) a été observée entre les enseignants accordant la priorité à l'amélioration des compétences pédagogiques et à la connaissance des tendances, et une amélioration de l'engagement des étudiants, de l'adaptabilité et de la résolution de problèmes. Il est à noter que ceux ayant suivi un plus grand nombre de CDPL ont démontré un plus grand enthousiasme pour l'apprentissage autonome et une meilleure maîtrise de la transmission des sujets. Les résultats soulignent le rôle essentiel des CDPL dans le développement professionnel des enseignants. L'accessibilité des modules en ligne, auto-rythmés et abordables favorise une participation élargie, contribuant ainsi à une amélioration de la qualité de l'enseignement.

Mots-clés : cours en ligne, développement professionnel, engagement des étudiants, MOOCs, compétences pédagogiques, compétences transversales

Introduction

Every country needs motivated, successful instructors as a cornerstone of education to educate and prepare the youth for a promising future aligned with the education system (Irgatoglu, 2021). Teacher quality is considered to be an important predictor of students' learning outcomes. The assessment of the performance of teachers, therefore, remains an essential precondition for enhancing the effectiveness of educational processes. There are two opposing concepts in teaching and learning: (i) traditional/teacher-centred teaching-learning approach, and (ii) contemporary/student-centred teaching-learning approach. Currently, a student-centred teaching-learning approach is required, wherein teachers can act as facilitators (Karatas & Arpaci, 2021). In this context, teachers are expected to support teaching and learning through collaboration, problem solving, and the effective use of technological tools, language, symbols, and texts (OECD, 2019). A change in classroom education can be brought about by enthusiastic teachers who have self-directed lifelong learning tendencies (Karatas et al., 2021). Hence, organising professional development courses for in-service teachers is the most appropriate way

to ensure better teaching-learning outcomes and maintain a high standard of teaching (Zhang et al., 2021). Professional development and peer learning are crucial for an organisation and the employees themselves. Reports indicate that teachers' professional development is important for educational institutions as it positively impacts classroom practices, enhances teacher well-being, and is a promising approach to tackling teacher shortages (Ventista & Brown, 2023).

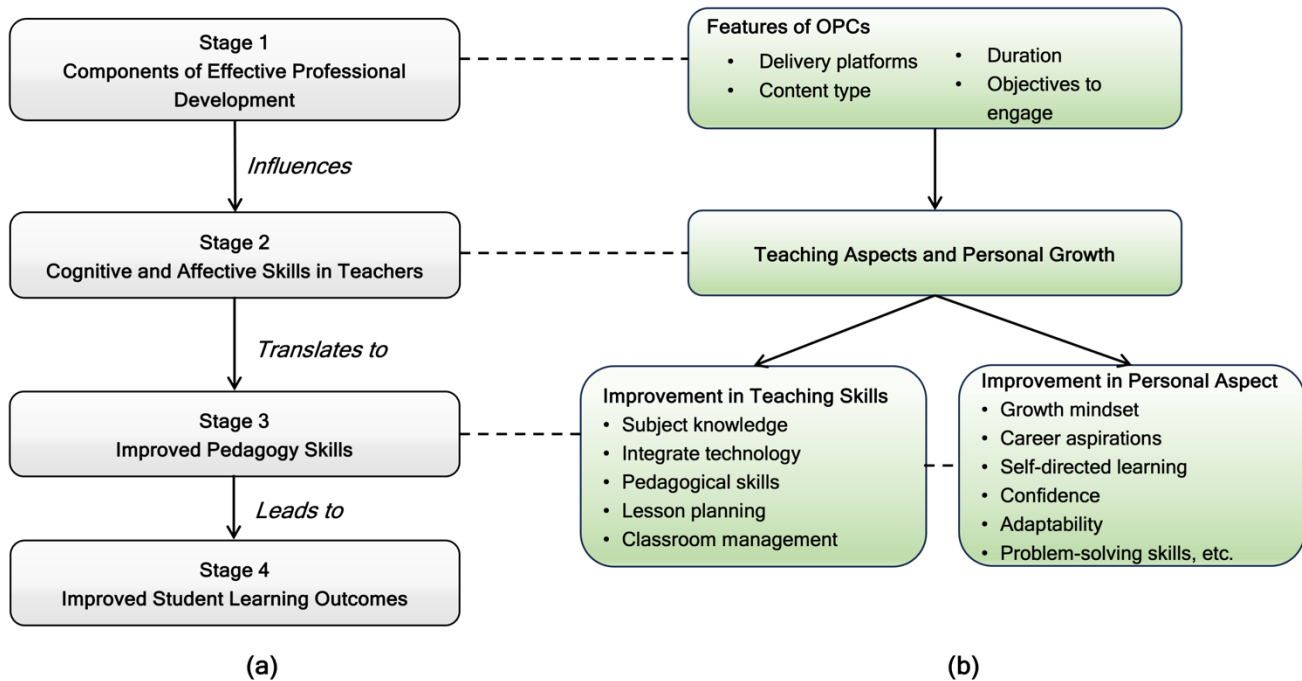
Professional development among teachers can be provided in different ways: formal courses or workshops, peer learning within the campus or in cooperation with other institutions, or informal events (Castaño-Muñoz et al., 2018). Recently, teacher professional development initiatives have expanded into online spaces, like multimedia websites and online courses, leading to the emergence of online professional courses (OPCs; Dede et al., 2016; Morina et al., 2025). These courses offer flexibility and more training possibilities for teachers (Castaño-Muñoz et al., 2018). Studies have shown that OPCs are as effective as face-to-face professional development trainings with respect to outcomes (Fishman et al., 2013). However, a systematic review of empirical MOOC literature reported that only 3.4% of published reports between 2014 and 2016 targeted instructors, whereas 50.7% were student-focused (Zhu et al., 2018). This scenario has changed post-Covid; however, there is still a need to evaluate the impact of teachers' OPCs on their personal and professional growth.

To establish the link between OPCs and student outcomes, it is imperative to examine the opportunities these courses provide to teachers and whether such activities are associated with improvements in students' learning. In this regard, Desimone (2009) offers a widely used model for evaluating teacher learning. The framework identifies five key features of professional development: content focus, active learning, coherence, duration, and collective participation. These features are understood to influence teachers' knowledge and skills, attitudes, and beliefs, which in turn mediate changes in instructional practices and student learning outcomes (Figure 1). In this model, teacher learning serves as a critical link between professional development experiences and classroom practice.

In the context of OPCs, these features may manifest through variables such as course content, engagement patterns, duration of participation, and collaborative or self-directed learning experiences. While Desimone's (2009) framework primarily emphasizes instructional and cognitive outcomes, the present study extends its application by also examining dimensions of personal growth as complementary outcomes of participation in OPCs. These are treated as analytical extensions rather than as inherent components of the original model. Guided by this extended perspective, our study aims to explore the interrelation between teachers' participation in OPCs and its impact on their knowledge, classroom practices, and student learning. It also examines the advantages of OPCs in improving instructors' competencies and professional growth alongside the challenges encountered.

Figure 1

Conceptual Framework Integrating Desimone's Model With Variables of the Present Study



Note. Schematic representation of (a) four-stage conceptual framework of professional development adapted from Desimone (2009), and (b) variables assessed in the present study. Dashed lines indicate the alignment between the framework's stage and the variables examined.

Method

Study Group

An observational study was conducted among teaching professionals in Mumbai, India, to understand the impact of OPCs on teaching and personal growth. The survey was conducted in English via an online structured questionnaire and administered using Google Forms. A total of 63 participants were recruited via convenience and snowball sampling through social media platforms. Eligible participants included college and university teachers who had completed at least one online course between 2019 and 2024. Before completing the questionnaire, participants were informed of the purpose of the study and advised that only aggregated data would be published to protect individual privacy. The participants voluntarily consented to participate in the study.

Evaluated Variables

The questionnaire was divided into four sections with a total of 21 questions. Section 1 was designed to collect demographic data such as age, gender, teaching experience, designation, and field of study (5 questions). Section 2 acquired data related to online professional courses (4 questions). Section 3 included questions about the impact of online courses on teaching (8 questions), while Section

4 aimed to determine the effect on personal growth of teaching professionals and recommendations (4 questions). Some items used a 5-point Likert-type scale (1 = not at all, 2 = slight, 3 = moderate, 4 = good, and 5 = excellent) to assess the perceived improvement, while others allowed participants to select one or multiple options.

Statistical Analysis

Descriptive analysis was carried out by determining frequencies and percentages for the variables under each category. Bivariate analyses were conducted to assess associations between categorical variables using the Chi-square test of independence, Fisher's exact test, and Fisher-Freeman-Halton test, depending on the distribution of data and sample size. The Chi-square test of independence was employed for larger sample sizes where the expected cell frequencies were ≥ 5 , ensuring the validity of the approximation to the chi-square distribution. When expected frequencies were < 5 , Fisher's exact test for 2×2 contingency tables and Fisher-Freeman-Halton test (an extension of Fisher's exact test) for 3×2 contingency tables were used to avoid relying on large-sample assumptions. These statistical tests were chosen to ensure reliable inference of associations between categorical variables with significance at $p < .05$.

Results and Discussion

This section adopts an integrated approach in which the reporting of findings and their interpretation are presented concurrently. Efforts have been made to ensure that empirical observations and interpretative insights remain distinguishable.

Demographic Characteristics of the Study Group

The study employed a cross-sectional online survey to investigate the perceived impact of OPCs on educators' teaching practices and personal growth. A 21-item online questionnaire was used to collect demographic information and data on respondents' OPC participation. A sample of 63 educators participated in the study; 62 valid responses were obtained after data cleaning. The demographic profile of the participants is presented in Table 1. Overall, the sample was predominantly female and spanned a wide range of age groups and levels of teaching experience. Most participants were from science and technology, followed by smaller proportions from humanities, management, and commerce.

Table 1

Demographic Information of the Respondents (N = 62)

Characteristics	n	%
Gender		
Female	47	75.8
Male	15	24.2

Characteristics		n	%
Years of age	Under 25	1	1.6
	25–34	16	25.8
	35–44	27	43.6
	45–54	10	16.1
	55 and above	8	12.9
Years of teaching experience	0–5	7	11.3
	6–10	18	29.0
	11–15	13	21.0
	16–20	10	16.1
	>20	14	22.6
Designation	Assistant professor	46	74.2
	Associate professor	10	16.1
	Professor	6	9.7
Participant field of study	Science and technology	41	66.1
	Humanities	11	17.7
	Management	6	9.7
	Commerce	4	6.5

Participation in OPCs: Delivery Platforms, Content, and Numbers

Quantitative analysis revealed the diversity and accessibility of various open-access platforms, enabling substantial participation among educators in these courses. Over the period 2019–2024, respondents' access to these courses was primarily facilitated through massive open online course (MOOCs) platforms, such as Coursera and NPTEL (58.1%), followed by university platforms (56.5%), and state/central government-recognized professional organizations (46.8%). College/institution level access accounted for only a minor proportion (9.7%). These findings align with a surge in interest in MOOCs during the COVID pandemic, where learners, including educators, sought open educational resources online. Notably, one-third of all learners who ever registered on a MOOC platform did so in 2020, making it the most consequential year since 2012, popularly referred to as the “Year of the MOOC” (Shah, 2020, para. 1).

In terms of course content, subject-specific courses were the most popular (74.2%). This was closely followed by pedagogy-based courses (59.7%), and then courses focusing on technological integration (56.5%). According to Schlager and Fusco (2003), educators pursue professional development programs to enhance their practices, implement new strategies, and gain knowledge and values that support the diverse needs of their students. The findings indicate a clear preference for OPCs that participants perceived as directly relevant to their teaching practice and student learning.

The extent of learners' engagement reflects the effectiveness of professional development courses (Vivante & Vedder-Weiss, 2023). In this study, a notable proportion of the respondents (59.7%) reported completing three to five OPCs, while 27.5% had undertaken more than five courses. Repeated

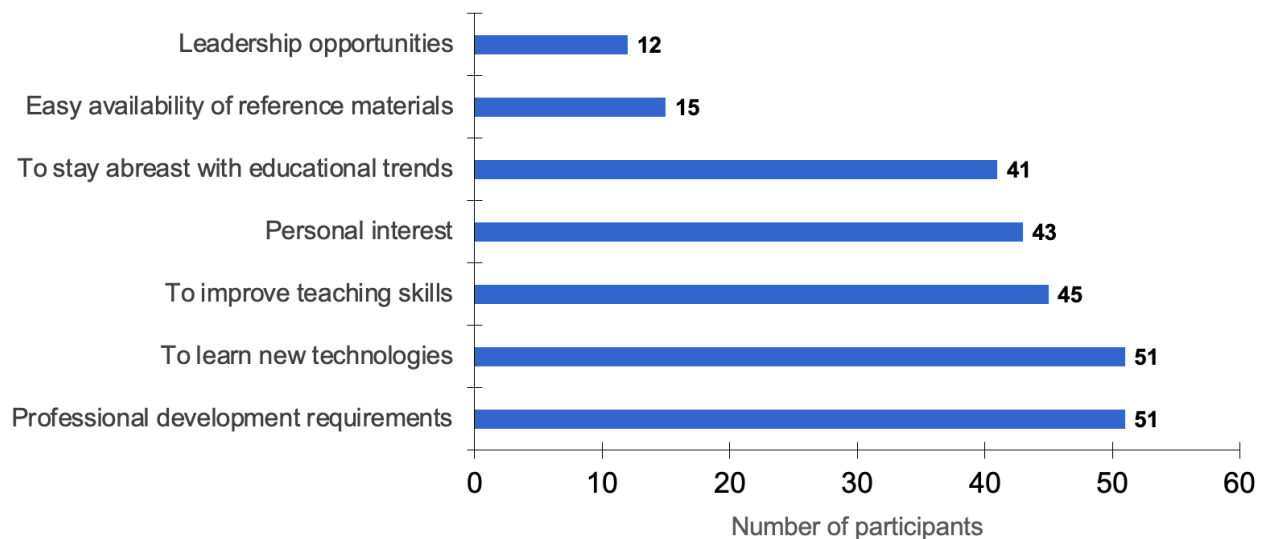
participation in multiple courses indicates sustained engagement and a strong commitment to online learning for continuous growth. It also highlights that learners find value in OPCs, reinforcing their role in effective professional development.

Objectives for Engaging in OPCs

Educators cultivate their professional growth primarily through active learning, reflective activities, and engagement in practice and professional development programs (Asterhan & Lefstein, 2024; Darling-Hammond, 2009; Desimone, 2009; Opfer & Pedder, 2013). Online professional courses provide learning-friendly environments, access to technological resources, mentors, and flexible learning options, leading to enhanced engagement among individuals (Field, 2000). However, motivation serves as a crucial driver in inspiring educators to acquire knowledge and expertise, set meaningful goals, and remain committed to continuous professional evolution (Abou Said & Abdallah, 2024; Deci & Ryan, 2008; Fütterer et al., 2024).

Figure 2

Objectives of Pursuing Online Courses Among Participants (N = 62)



Radford et al. (2015) reported a positive perception toward OPCs, citing improvement in soft skills, basic computer literacy, and understanding of highly technical subjects, such as analytics, technology, engineering design, blueprint design, and mental health, all contributing to professional development. In the present study, responses suggest that participants were motivated to engage in OPCs by both professional requirements and the development of new technological skills. These reasons affirm the pragmatic approach of respondents to meet standards and enhance their technological proficiency. Other objectives included improving teaching skills, personal interest, and staying current with educational trends. Conversely, the easy availability of reference materials and perceived opportunities for leadership were reported to be less influential factors in driving OPC participation.

(Figure 2). Castaño-Muñoz et al. (2018) highlighted the importance of teacher professional development to improve understanding of the primary subject field, information and communication technology (ICT) skills for teaching, student assessment and counselling, teaching in multicultural settings, supporting students with special learning needs, and managing institutional administrations.

Impact of OPCs on Teaching Aspects and Student Performance

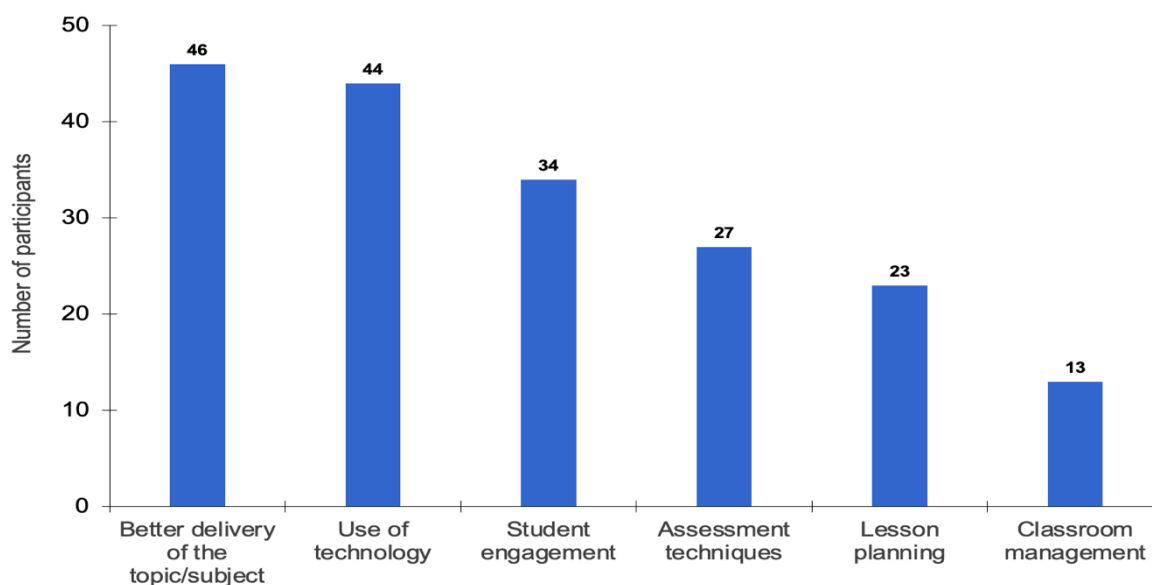
In today's educational landscape, the role of the teacher is evolving from traditional instructor to a more varied and multifaceted professional. Teachers are now expected to be technologically adept, providing not only subject mastery but also critical thinking, creativity, and motivation in their students. They must cater to diverse learning needs, foster student engagement through student-centred environments that encourage inquiry and dynamic learning, and balance curriculum standards (Amin, 2016). In our study, over half of the respondents (53.2%) reported applying the knowledge and skills gained from OPCs in their regular classroom teaching. Following completion of OPCs, more than 50% of educators reported the greatest improvements in topic delivery, use of technology, and student engagement. Aspects related to assessment, lesson planning, and classroom management were rated as the areas with comparatively lower impact (Figure 3).

To validate these perceptions, educators rated their improvement in subject knowledge, pedagogical skills, technological integration, and motivation for teaching using a 5-point Likert scale (1 = not at all, 2 = slight, 3 = moderate, 4 = good, and 5 = excellent; Figure 4). The evaluations aligned with their initial perceptions, indicating overall positive gains. A substantial majority of respondents (75.8%) perceived improvements in student performance following completion of an OPC. However, 24.2% reported no observed change. These findings are consistent with earlier studies demonstrating that OPCs can improve teachers' knowledge, skills, and self-efficacy (Guerrero, 2025; Rakap et al., 2015; Reeves & Chiang, 2019; Wong et al., 2023). Research also suggests that while these gains can have a positive impact on student learning and achievements, the outcomes are usually more significant at the educator level than at the student level (Frumin et al., 2018; Morina et al., 2025). Since these observations were not based on quantitative measurements in the present study, it is difficult to determine the statistical significance of the perceived improvements.

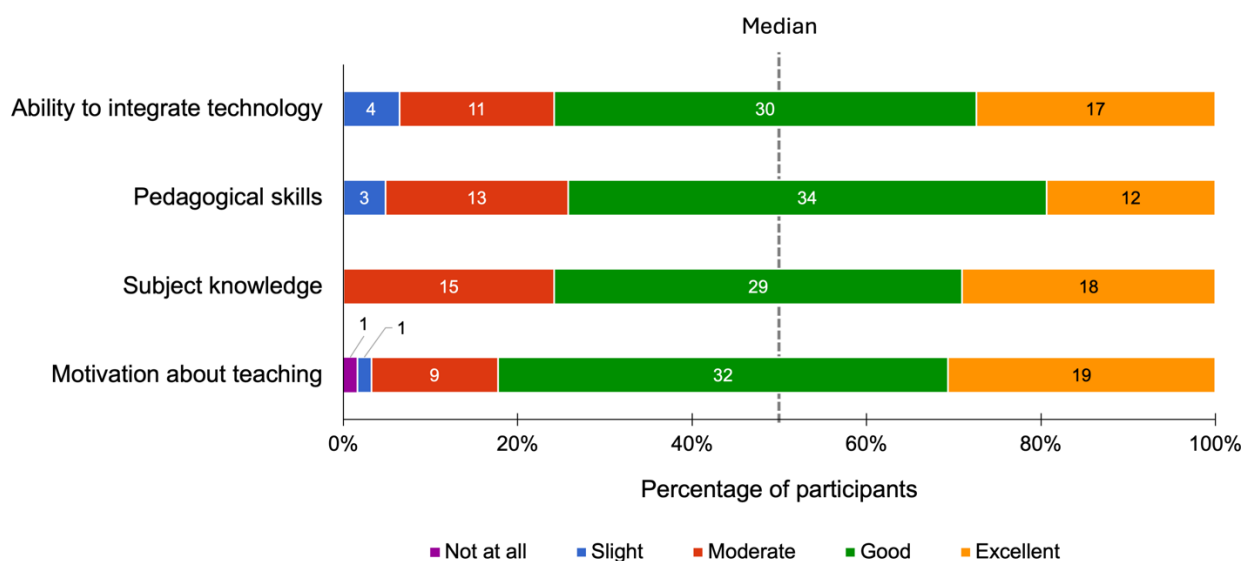
Among the challenges participants faced in applying their online learning in the classroom, 83.9% cited time constraint as the primary obstacle, followed by resource accessibility (51.5%), cost (24.2%), and institutional motivation or support (19.4%). In line with our findings, significant barriers to professional development among Spanish teachers have been identified as lacking in employers' support, participation incentives, and relevant professional development opportunities as well as conflict with work schedules (Castaño-Muñoz et al., 2018).

Figure 3

Impact on Teaching Aspects of the Participants (N = 62) via OPCs

**Figure 4**

Improvement in Teaching Skills After an OPC Course Completion on a 5-Point Rating Scale



Note. The number in each bar indicates the frequency of participants (N = 62).

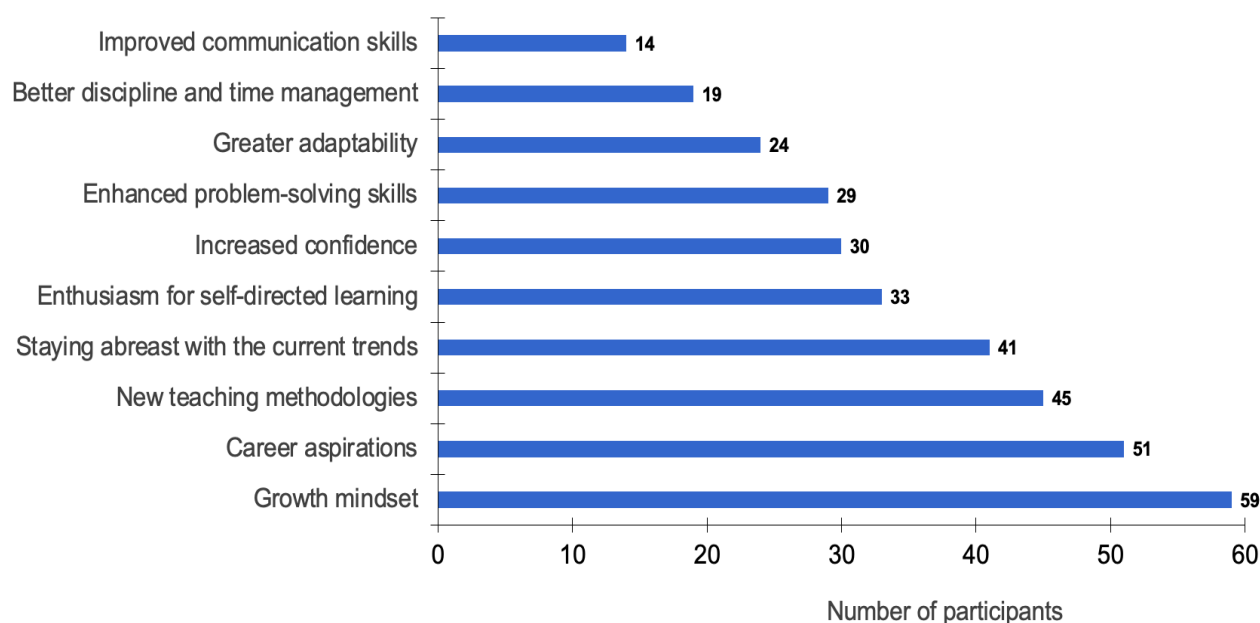
An open mind, confidence in learning ability, curiosity to investigate new ideas, willingness to embrace challenges, overcoming obstacles, and adapting to ever-changing demands are the key factors in making any learning successful for an individual (Aspin & Chapman, 2007). Therefore, to become

effective learners or educators, individuals must actively seek knowledge from diverse sources and cultivate a growth and adaptability mindset (Figel, 2006; Tüfekçi & Demirel, 2009). A similar pattern appeared in this study, where many educators reported substantial personal growth following participation in OPCs. They noted improvements across a range of skills, including a stronger growth mindset, increased confidence, enhanced problem-solving abilities, greater adaptability, better time management, and improved communication (Figure 5).

Self-directed learning involves taking initiatives, identifying the learning needs, implementing suitable learning strategies, and evaluating learning outcomes (Abou Said & Abdallah, 2024). Baden and Major (2004) also suggested that self-directed learning can help educators become free, evolved, and authentic. More than 50% of the participants in our OPC study demonstrated enthusiasm for self-directed learning (Figure 5), reflecting their natural desire for knowledge, self-discipline, and the ability to regulate their learning behaviours.

Impact of OPCs on Personal Growth

Drawing on Desimone's (2009) conceptual framework as an analytical lens, the findings from the univariate descriptive analysis may be interpreted in relation to the sequential components of professional development. Teachers' participation in structured OPCs appears to reflect several core features of effective professional development, including content focus and coherence, as indicated by the predominance of subject- and pedagogy-related courses, as well as active engagement over time, as suggested by the completion of multiple courses. At the level of teacher learning, participants reported positive changes in subject knowledge, pedagogical skills, and professional orientations, including confidence and motivation. These patterns are consistent with the mediating role of teachers' knowledge, attitudes, and beliefs described in the framework. Reported changes in instructional practices, such as improvements in topic delivery, use of technology, and student engagement, further suggest that aspects of professional learning may be reflected in classroom practice. Participants also perceived improvements in student engagement and performance. While such perceptions should be interpreted with caution and do not establish causal relationships, they are broadly consistent with the final stage of Desimone's model, in which changes in instructional practice are associated with student learning outcomes. Overall, the observed patterns mirror the four-step progression outlined in Desimone's framework, supporting its relevance for examining the potential impact of OPCs in this context.

Figure 5*Impact on Aspects of Personal Growth of the Participants (N = 62)*

Association of OPCs With Outcomes

To determine the statistical significance of the relationship between teachers' objectives for enrolling in OPCs and their observed outcomes, chi-square tests of independence and Fisher's exact tests were applied. Descriptive findings suggested broad perceived benefits, whereas bivariate analysis linked some specific outcomes to teachers' stated objectives (Table 2).

The chi-square test revealed that teachers who primarily aimed to improve their teaching skills experienced significantly better student engagement and enhanced problem-solving skills ($p < .05$). A plausible explanation is that exposure to diverse and structured OPCs supported the transfer of pedagogical knowledge into classroom practice (Opfer & Sprague, 2018). Similarly, teachers who prioritized staying abreast with current trends reported greater adaptability, improved student engagement, and enhanced proficiency in their subject ($p < .05$), highlighting the goal-oriented impact of online learning on personal and professional development. Furthermore, pursuing OPCs for easy access to reference materials significantly improved lesson planning and assessment techniques ($p < .05$) among teachers.

Associations involving expected cell frequencies less than five were evaluated using Fisher's exact test. A significant association was found between personal interest in OPCs and improved communication skills ($p < .05$), suggesting that intrinsic motivation contributes to translating online learning into personal competencies. Conversely, teachers who sought to learn new technologies did not show statistically significant association with skill development in integrating technology into their teaching ($p > .05$). This divergence suggests a distinction between pedagogical and technological

learning. While pedagogical competencies may be more readily transferable across teaching environments, participation in OPCs alone may not be sufficient to support adoption of technology in teaching practice. It can be further hindered by the complex nature of digital technologies, which are often protean (usable in many different ways), rapidly evolving, and opaque (the inner workings are hidden from users), making them difficult for teachers to understand and apply. These challenges are compounded by limited technology-enabled practical training, misalignment with teachers' pedagogical beliefs, insufficient institutional support, and inadequate consideration for diverse teaching contexts (Koehler & Mishra, 2009). Thus, its effective implementation requires sustained hands-on training, motivation, access to appropriate subject-specific teaching tools, ongoing technical support, and familiarity with technological tools in classroom settings to enhance student learning (Granić, 2022; Sumner & Hostetler, 1999). In a study from sub-Saharan Africa, Stutchbury et al. (2025) found that teachers were proud to see their efforts of online learning via MOOCs translating into becoming better educators. This, in turn, led to successful ICT integration into teaching and greater student engagement. Therefore, technology-focused OPCs should be supplemented with mentoring, peer collaboration, and practical workshops to ensure meaningful and sustained adoption of digital tools in teaching.

Table 2

Association Between Objective and Outcome of Engaging in OPCs

Objective to engage in OPCs	Objective set	Outcome achieved		χ^2 (df)	p-value*	
		Yes (Y)	No (N)			
Improve teaching skills		Student engagement (T)				
	Y	29	16	6.115 (1)	.013	
	N	5	12			
		Enhanced problem-solving skills (P)				
	Y	26	19	7.982 (1)	.005	
	N	3	14			
	Stay abreast with current trends		Student engagement (T)			
		Y	27	14	5.930 (1)	.015
N		7	14			
		Greater adaptability (P)				
Y		20	21	4.433 (1)	.035	
N		4	17			
		Staying abreast with trends in subject (P)				
Y		31	10	4.858 (1)	.028	
N		10	11			

Objective to engage in OPCs	Objective set	Outcome achieved		χ^2 (df)	p-value*
		Yes (Y)	No (N)		
Easy availability of reference material		Lesson planning (T)		4.448 (1)	.035
	Y	9	6		
	N	14	33		
		Assessment techniques (T)		4.302 (1)	.038
	Y	10	5		
	N	17	30		
Personal interest		Increased confidence (P)		3.099 (1)	.078
	Y	24	19		
	N	6	13		
		Improved communication skills (P)		Fisher's exact test	.003
	Y	14	29		
	N	0	19		
Learn new technologies		Use of technology (T)		Fisher's exact test	.152
	Y	34	17		
	N	10	1		

Note. The data are represented in the form of 2×2 contingency tables for each objective-outcome attribute with the observed frequency indicated in each cell. Abbreviations df, Y, N, T, and P indicate degrees of freedom, yes, no, teaching aspect, and personal growth, respectively. p-value was calculated using the Chi-square test and Fisher's exact test, wherever applicable.

The effectiveness of a professional development course depends not only on the quality of the content but also on the high degree of learners' engagement (Vivante & Vedder-Weiss, 2023). Previous studies have reported that learners' engagement is key to successful learning and outcomes (McDonough, 2014; Ornelles et al., 2019). We also investigated whether engaging in more OPCs is associated with enhanced skill development. The number of OPCs completed was categorised as 1–2, 3–5, and more than 5 courses, and its association with relevant teaching- and personal-growth-related outcomes (reported as Yes/No) was examined using the Fisher–Freeman–Halton extension of Fisher's exact test. The results indicate that teachers who completed more OPCs reported significantly greater enthusiasm for self-directed learning and improved topic delivery ($p < .05$), as well as marginally higher levels of problem-solving skills ($p < .1$) (Table 3). Although positive outcomes were descriptively reported across all engagement levels, the strength and statistical detectability of these associations varied, with more consistent patterns observed among categories representing sustained participation. This suggests that professional learning gains through OPCs become reliably detectable with repeated engagement, rather than implying that there is no benefit at lower levels of participation.

Notably, the heightened enthusiasm for self-directed learning indicates a growing intrinsic motivation and positive perception among respondents towards OPCs to continuously update their

knowledge, which is crucial in adapting to evolving educational needs. The findings also suggest that repeated participation in OPCs helps teachers refine their instructional strategies to make them more engaging and effective. This pattern aligns with Desimone's (2009) assertion that sustained engagement over time is more likely to translate professional learning into meaningful instructional change. Exposure to diverse topics and methodologies enhances their problem-solving skills, fostering critical thinking, adaptability, and confidence. However, a relatively weaker association for problem-solving skills may be due to the integrative and higher-order nature of this competency, which depends upon multiple cognitive, pedagogical, and contextual factors (Zhao et al., 2021), and may require additional or varied learning experiences for proper attainment. Overall, repeated participation in OPCs supports teachers' belief that these courses will equip them to sustain their personal and professional growth beyond the specific course content.

Table 3

Association of the Number of OPCs With the Aspect of Teaching and Personal Growth

OPCs pursued during 2019–2024		Outcome achieved		p-value*
		Yes	No	
		Enthusiasm for self-directed learning (P)		
No. of OPCs	1–2	1	7	.0266
	3–5	20	17	
	>5	12	5	
		Better delivery of the subject (T)		
No. of OPCs	1–2	3	5	.0476
	3–5	29	8	
	>5	14	3	
		Enhanced problem-solving skills (P)		
No. of OPCs	1–2	6	2	.0598
	3–5	22	15	
	>5	5	12	

Note. Data are represented as a 3×2 contingency table for the number of courses-outcome attribute with the observed frequency indicated in each cell. Abbreviations T = teaching aspect; P = personal growth. p-value was calculated using the Fisher-Freeman-Halton Test.

Collectively, these findings suggest that the perceived impact varies according to teachers' motivations, patterns of engagement, and how they apply what they learn.

Recommendations

The participants suggested key recommendations to enhance their professional development through online learning. They strongly advocated for dynamic and engaging online sessions, moving away from traditional, lecture-heavy formats that often lead to boredom. Participants advocated for targeted, subject-specific courses, particularly in analytical instrumentation, innovative teaching methodologies, and emerging technologies like AI in education to ensure relevance and applicability. They expressed a preference for self-paced learning modules to accommodate their demanding schedules and highlighted the importance of interactive elements such as discussion forums, live practicals and live tutor contact to facilitate deeper understanding and keep pace with the evolving education sector. They also suggested that reducing administrative burdens would free up valuable time for professional development. Finally, participants highlighted the importance of accessible and affordable online courses, suggesting that institutions should consider offering more free or low-cost options to encourage wider participation and develop quality teaching.

Conclusion

This study suggests that OPCs may play an important role in supporting educators' ongoing professional growth. The accessibility of MOOC platforms and the preference for subject-specific content effectively cater to the educator's needs. Many educators demonstrated sustained engagement through multiple course completions, indicating a strong commitment to continuous online learning. The primary motivators for participation included professional development requirements and the acquisition of new technological skills, highlighting the practical value of OPCs. Notably, OPCs enhanced educators' topic delivery, technology utilization, and crucial soft skills such as growth mindset, confidence, problem-solving, adaptability, time management, and communication. The bivariate analysis demonstrates that positive outcomes in online professional learning are dictated by motivation and engagement intensity. To maximize the impact of OPCs, course designers should integrate more practice-oriented activities, recommend subject-specific technology-based teaching tools, and incorporate formative feedback mechanisms to support effective transfer of learning into classroom practice. While a substantial proportion of respondents perceived improvements in student performance, the absence of quantitative data necessitates further investigation. Time constraints, resource accessibility, and a lack of institutional motivation were identified as key deterrents to OPC participation. Thus, institutions should provide structured time for professional learning, access to digital infrastructure, and formal recognition or incentives for course completion. Consequently, interactive, engaging, and affordable learning modules can ensure broader participation, leading to a substantial enhancement in the quality of teaching.

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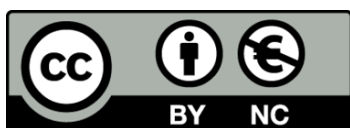
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