Building and sustaining online communities of practice for professional development

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Abstract
The rapid shift toward digital pedagogies in tertiary institutions has exposed significant limitations in traditional professional development models, particularly the absence of sustained collaboration, reflective practice, and peer-mediated learning. This situation highlights the need to develop effective online Communities of Practice (CoPs) to support continuous professional development. This study employed a descriptive survey design to identify factors influencing the formation and sustainability of online CoPs among practitioners in tertiary institutions in Anambra State. A total of 120 participants, including lecturers, administrative staff, and students, responded to a Google Survey questionnaire using a four-point Likert scale to assess perceptions of relevant factors, engagement strategies, and challenges. Data were analyzed using descriptive statistics, including means, medians, standard deviations, and percentages. Findings indicate that access to collaborative platforms and reliable internet connectivity are the most critical factors in establishing online CoPs, followed by shared goals, effective leadership, and trust among members, highlighting the importance of both technological infrastructure and interpersonal relationships. Continuous engagement activities and feedback mechanisms were found to sustain participation, while peer support and interactive tools showed moderate influence. Major challenges identified include limited digital skills, ineffective leadership, low motivation, connectivity problems, and time constraints, suggesting that human, technological, and structural factors jointly affect the sustainability of online professional communities. The study concludes that successful online CoPs require a balanced integration of technological infrastructure, supportive interpersonal dynamics, and well-structured engagement strategies. When effectively implemented, online CoPs can enhance professional learning, promote collaboration, and support continuous development among tertiary institution practitioners.

1. Introduction

The need to create and maintain online Communities of Practice (CoPs) to support professional growth has been acute due to the rapid technological change, globalization, and changing workplace demands. The shift to digital learning conditions, which has been compounded by the COVID-19 pandemic, has revealed the constraints of the traditional, episodic concept of professional development, while digital learning environments increasingly encourage interactive and collaborative learning experiences supported by technology (Reihan & Juhana., 2025). An accumulating literature suggests that numerous professionals have limited opportunities of long-term cooperation, reflective conversations, and knowledge exchanges outside of workshops (Trust and Whalen., 2021). There is, therefore, an urgent need to develop systematic but flexible online communities that instill lifelong learning, mutual assistance and joint problem-solving.

Originally developed by Etienne Wenger, CoP assemblies of people with a common concern or passion in their area who learn to further the practice through frequent interaction with each other. In the cyberspace, virtual forums enable geographically distributed professionals to conduct collaborative inquiry, resource, and co-construct knowledge. Recent studies support the idea that properly organized online CoPs promote the development of professional identity, reflective praxis, and innovation (Lantz-Andersson et al., 2022). Online CoPs therefore overcome institutional boundaries and present dynamic spaces of enduring professional development.

Efficient online CoPs are based on developing a well-defined domain and purpose. A clear sense of focus fosters dedication and relevance, hence making the engagement congruous to the professional needs of the members. Baran and AlZoubi (2022) argue that the clarity of the goals and their relevance to the real-life problems of practitioners are strong indicators of long-term involvement in professional online learning communities. The role of leadership is of a crucial character at the stage of forming; the facilitators have to develop the sense of trust and stimulate the open conversation, modelling the knowledge-sharing behavior. As opposed to top-down models of training, effective CoPs have decentralized leadership, which helps in creating a sense of ownership and collective responsibility.

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Another important pillar is technological infrastructure. Appropriate, easy-to-use platforms enabling both synchronous and asynchronous communication are essential in maintaining the level of interaction, as digital learning tools and interactive media can support collaborative engagement and flexible knowledge exchange in online learning environments (Efendi et al., 2025). However, technology is not a guarantee of participation, as Rapanta et al (2022) point out that social presence, reciprocity, and collaborative culture are more critical than platform sophistication. Thus, the development of social capital, respect, and common standards is the core of the community vitality. The relationships can be strengthened by regular virtual conferences, discussion forums, collaborative projects, and peer feedback systems that will enhance learning.

The maintenance of online CoPs requires deliberate mechanisms of maintaining motivation and value. A salient determinant consists in relevance to practice; members continue to be active when discussions directly address real problems and come up with practical solutions. Hall (2022) found that professionals involved in problem-based online CoPs had greater self-efficacy and professional satisfaction. Commitment is also enhanced with recognition of contribution, leadership rotation possibilities and proven practice impact. Conversely, communities that lack feedback mechanisms or physical deliverables tend to lose people.

Continuous evaluation and adaptation are another important dimension. Good CoPs are responsive to the needs of the members, changes in technology and changes in context. Evidence-based feedback- Through surveys, analytics, or feedbacks, data-driven reflection can be used to see participation gaps and new priorities. Falk and Drayton (2015) highlight that sustainable online professional communities are built around reflective cycles, which enable the members to review progress and redefine goals together. This is a progressive method that alleviates stasis, and keeps things relevant long-term.

This study is motivated by the emerging issues of issues with respect to the effectiveness and sustainability of professional development practices in tertiary institutions in Nigeria, or in the state of Anambra, to be more precise. In spite of the increased effort in workshops, seminars and conferences, current academic staff members view such programs as occasional, imposed, and rarely helpful in long-term cooperation or thoughtful practice. It is suggested by global research that online Communities of Practice enhance the ongoing learning process, mentorship, and professional identity formation (Lantz-Andersson et al., 2022). However, the current literature is largely concentrated around Western or high-income environments, and there is a gap in the empirical literature on the operations of online CoPs in Nigerian tertiary environments.

Additionally, although the establishment of CoP as a socially situated system of learning by Wenger is a conceptual framework, there is limited literature on the role of institutional cultures, infrastructural constraints, and digital literacy levels in Anambra State to develop CoP and sustainability. According to Seufert et al (2020), successful online professional communities must be institutionalized and digital competent, aspects that are not equally distributed among most Nigerian institutions. This gap in context supports the need to have an empirically based study specific to the Anambra State tertiary institutions to inform policy and practice.

This study seeks to address several key questions related to the development and sustainability of online Communities of Practice (CoPs) for professional development among practitioners, namely: a) what factors influence the effective building of online communities of practice for professional development among practitioners?; b) what strategies are most effective in sustaining engagement in online communities of practice?; and c) what challenges hinder the building and sustainability of online communities of practice for professional development?.

2. Literature review

Successful establishment of online communities in schools is an effective way to boost cooperation, sharing of information, and interaction between students, educators and school leaders. Digital tools such as learning management systems, discussion forums, and social media groups can be used as channels of communication and group learning. Participation is also supported with interactive learning approaches like experiential learning and authentic assessment, which foster significant interaction between learners (Muogbo et al., 2025; Nnorum & Okafor, 2011). In addition, the combination of problem-solving methods enhances academic engagement and critical thinking of students in online environments (Okafor, 2019). The technological and scientific skills necessary in modern education also are developed with the help of well-organized online communities (Nneka & Okafor, 2013). To maintain the readability, enable content assessment, and support a healthy generative learning atmosphere, educators should become the champions of ethical behaviors and responsible online actions (Obikezie et al., 2023; Okafor, 2010). Moreover, the motivation and engagement of students in online educational communities in schools can be supported through gamification and activities that are driven by technology (Enem et al., 2025). Collectively, successful online school communities facilitate learners to be inclusive, collaborate, and perpetuate academic growth.

The maintenance of the interest toward online communities of practice within the school context requires interaction, content, and collaborative learning opportunities on a continuous basis. Participation is enhanced

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through experience sharing, discussion of practical challenges and the joint generation of solutions which refine the educational practices and collectively. In these communities, efficient communication and engagement cannot be achieved without stable digital infrastructure (Anyakora et al., 2021). The environmental and social concern promotes the discussion and expands the learning point of view among school populations (Okafor et al., 2022; Odimegwu & Ikeotuonye, 2023). Organized events, such as webinars, mentoring by peers, and group projects, are used to maintain the interest and participation of the members. The fostering of good conditions that allow free flow of ideas fosters long-term commitment to the community. Moreover, responsible management with sustainable practices and practices contributes to improving the sustainability of collaborative networks (Anyakora et al., 2025; Ikeotuonye & Efobi, 2022). The contextual issues tackled in communities also enhance the contextual learning and involvement of individuals (Onwuka et al., 2017). Finally, long-term interactions and interactions stimulate knowledge sharing, professional development and constant improvement of school communities of practice.

The technological, institutional, and ethical barriers form some of the challenges that hinder the formation and maintenance of online communities of practice in professional development. Poor digital infrastructure and interruptions caused by socio-economic conditions may reduce the engagement and sustainability in professional learning environments (Ikechukwu & Odimegwu, 2021). Trust and collaboration in online communities can be undermined by ethical issues that include conflict of interest and professional irresponsibility (Okosa et al., 2025). In addition, unarticulated policies and legal ambiguity may deter active knowledge sharing between professionals (Okosa, 2022; Okosa, 2018). The sustainability of such online communities is also endangered by environmental and institutional issues, such as adjustment to sustainable practices and changing professional standards (Morell, 2014). To maintain efficient online professional communities, it is imperative to address such barriers through improving infrastructure, ethical standards, development of inclusive policies, and institutional backing.

3. Method

This research utilized a descriptive survey research design to explore the factors affecting the formation and maintenance of online Communities of Practice (CoPs) as a means of professional development with practitioners in tertiary institutions in Anambra State. It was considered relevant as it will help collect and analyze data on the perceptions, experiences, and challenges of participants involved in online CoPs in a systematic manner, which will yield quantitative evidence to make well-reasoned conclusions (Creswell & Creswell, 2018). The study population included lecturers, administrative staff and students in sampled tertiary institutions within Anambra State. A purposive sampling method was used to represent these groups; however, to capture the groups, it is necessary to address active participants in professional development activities. The total number of respondents involved in the study was 120, and thus the information encompassed a wide range of experiences, roles, and opinions regarding online engagement and collaborative professional learning.

A structured questionnaire was used to collect data through the Google Survey, which made it easy to spread the questionnaire, respondents could use it easily, and it was also used to capture data on time. The questionnaire was structured around the research questions: what will be the effects of creating online CoPs, how to maintain engagement, and what will make the process of creating and maintaining online CoPs difficult? Responses were measured on a 4-point Likert scale, where 1 (Very Low Extent) to 4 (Very High Extent). The decision to use a 4-point scale removed a neutral middle territory, thus influencing respondents to adopt a definite position on individual items and improve the results clarity (Bryman, 2016). The tool was content and face-validated by professionals in the field of educational technology and professional development to ascertain the relevance, clarity, and representation of the items by constructs being studied. The Cronbach alpha was used to test the reliability of the questionnaire, and it was found that the alpha was high in all sections, thus supporting the fact that items always measured what the questionnaire intended to measure.

Descriptive statistics tools, such as means, median, standard deviation, and percentages, were utilized to analyze the collected data and summarize the trends and identify the most important factors, strategies, and challenges. The analysis has presented a clear picture of the factors that most contributed to the formation and maintenance of online CoPs and the obstacles that crippled the effectiveness of online CoPs. The application of Google Survey made it possible to collect data efficiently, securely, and perform automated coding and export to statistical software to analyze it.

4. Results and Discussion

4.1. Result

The demographic characteristics of the respondents were first examined to provide an overview of the sample involved in this study. One important demographic variable considered was the age distribution of the respondents, as presented in Figure 1.

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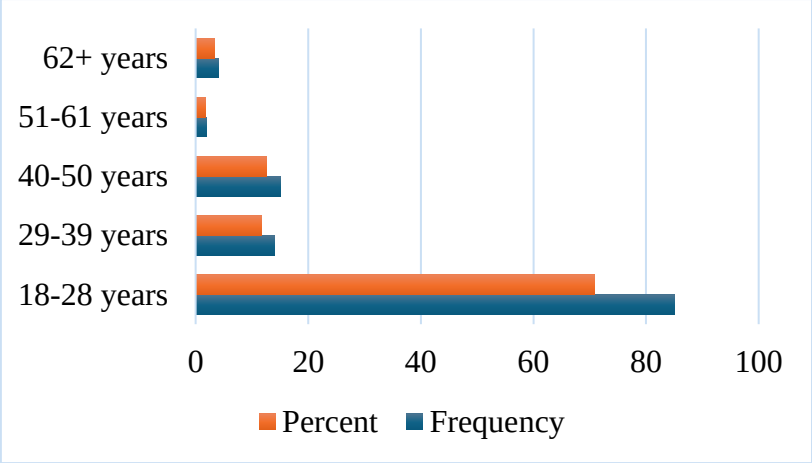

Figure 1. Age Distribution of Respondents (N = 120)

Figure 1 shows that the majority of respondents were aged 18–28 years (85; 70.8%), indicating a predominantly young population. This is followed by those aged 40–50 years (15; 12.5%) and 29–39 years (14; 11.7%). Few respondents were aged 62+ years (4; 3.3%) and 51–61 years (2; 1.7%). Cumulatively, most participants (99; 82.5%) were below 40 years. Furthermore, the professional roles of respondents within their institutions were analyzed to understand their involvement in professional activities. The distribution of respondents by institutional role is shown in Figure 2.

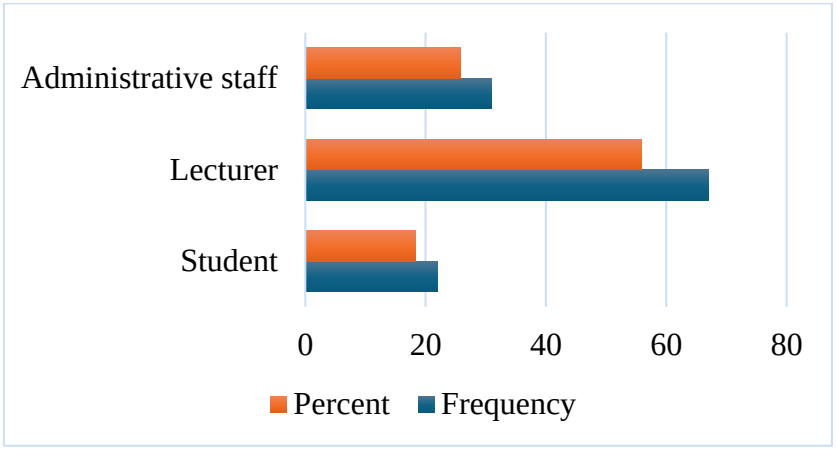

Figure 2. Role of Respondents in the Institution (N = 120)

Figure 2 indicates that lecturers constituted the majority of respondents (67; 55.8%), suggesting strong academic staff representation. Administrative staff accounted for (31; 25.8%), while students formed the smallest group (22; 18.3%). Cumulatively, staff members (lecturers and administrative staff) represented (98; 81.6%) of participants, implying that responses largely reflect professional and institutional perspectives rather than student views. Next, Figure 3 shown an gender distribution of respondents.

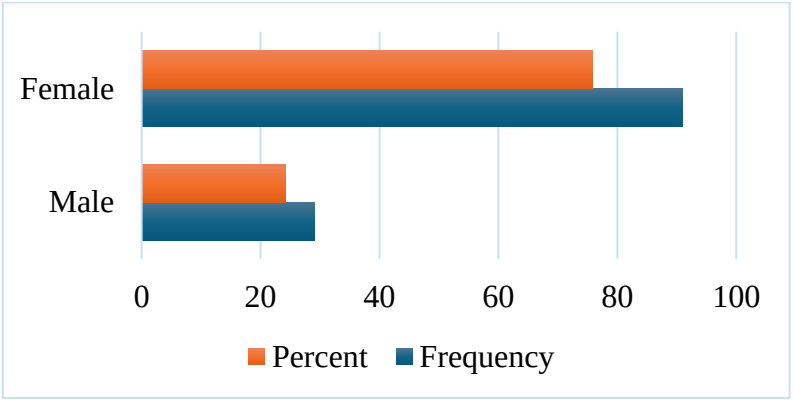

Figure 3. Gender Distribution of Respondents (N = 120)

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Figure 3 reveals that female respondents constituted the majority (91; 75.8%), while males accounted for (29; 24.2%). This indicates a predominantly female sample. The cumulative percentage shows full representation at (120; 100.0%). The distribution suggests that findings may largely reflect female perspectives, which could influence interpretations related to participation and engagement in professional development activities.

Research question 1: What factors influence the effective building of online communities of practice for professional development among practitioners?

Factors influencing the effective building of online communities of practice can be seen in Table 1.

Table 1. Factors Influencing the Effective Building of Online Communities of Practice (N = 120)

		Shared goals support community building.	Reliable internet encourages participation.	Effective leadership improves community formation.	Trust among members promotes interaction.	Collaboration opportunities strengthen the community.
N	Valid	120	120	120	120	120
	Missing	0	0	0	0	0
Mean		3.43	3.46	3.39	3.29	3.49
Std. Error of Mean		.054	.050	.051	.068	.050
Median		3.45[a]	3.47[a]	3.41[a]	3.36[a]	3.50[a]
Mode		3[b]	3	3	4	4
Std. Deviation		.589	.548	.555	.749	.550
Variance		.347	.301	.307	.561	.302
Skewness		-.455	-.299	-.161	-.659	-.429
Std. Error of Skewness		.221	.221	.221	.221	.221
Kurtosis		-.671	-1.009	-.879	-.500	-.932
Std. Error of Kurtosis		.438	.438	.438	.438	.438
Range		2	2	2	3	2
Sum		411	415	407	395	419
Percentiles	25	2.86[c]	2.92[c]	2.81[c]	2.63[c]	2.98[c]
	50	3.45	3.47	3.41	3.36	3.50
	75	3.97	3.98	3.92	3.95	.

a. Calculated from grouped data.
b. Multiple modes exist. The smallest value is shown
c. Percentiles are calculated from grouped data.

As it is seen in Table 1, collaboration opportunities receive the highest mean mark regarding the role it plays in community building (Mean = 3.49) followed by reliable internet access (Mean = 3.46) and shared goals (Mean = 3.43). Leadership (Mean = 3.39) and the trust between members (Mean = 3.29) are a little lower, but still significant. The implications of these findings are: the technological infrastructure and interpersonal dynamics are necessary to promote active participation and guarantee sustainable interaction in online communities of practice among practitioners.

Research question 2: What strategies are most effective in sustaining engagement in online communities of practice?

Table 2shown a strategies for sustaining engagement in online communities of practice.

Table 2. Strategies for Sustaining Engagement in Online Communities of Practice (N = 120)

		Regular activities sustain engagement.	Feedback motivates continued participation.	Relevant content keeps members active.	Interactive tools increase involvement.	Peer support encourages retention.
N	Valid	120	120	120	120	120
	Missing	0	0	0	0	0
Mean		3.45	3.38	3.06	3.08	3.13
Std. Error of Mean		.053	.056	.067	.060	.060
Median		3.47[a]	3.40[a]	3.09[a]	3.12[a]	3.16[a]
Mode		4	3	3	3	3
Std. Deviation		.578	.609	.737	.656	.660
Variance		.334	.371	.543	.430	.436
Skewness		-.467	-.415	-.221	-.450	-.149
Std. Error of Skewness		.221	.221	.221	.221	.221

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		Regular activities sustain engagement.	Feedback motivates continued participation.	Relevant content keeps members active.	Interactive tools increase involvement.	Peer support encourages retention.
Kurtosis		-.711	-.644	-.735	.691	-.699
Std. Error of Kurtosis		.438	.438	.438	.438	.438
Range		2	2	3	3	2
Sum		414	405	367	370	376
Percentiles	25	2.90[b]	2.78[b]	2.38[b]	2.46[b]	2.48[b]
	50	3.47	3.40	3.09	3.12	3.16
	75	3.99	3.94	3.73	3.70	3.75

a. Calculated from grouped data.
b. Percentiles are calculated from grouped data.

Table 2 shows that regularly activity was considered the most effective strategy to maintain engagement (Mean = 3.45), then feedback mechanisms (Mean = 3.38). Peer support (Mean = 3.13) and the interactive tools deployment (Mean = 3.08) are moderately effective, and relevant content ensures the lowest mean (Mean = 3.06). Therefore, the data show that organized engagement, acknowledgment through feedback and supportive interaction by peers are essential factors in the sustenance of active participation in the online communities of practice over time.

Research question 3: What challenges hinder the building and sustainability of online communities of practice for professional development?

Challenges hindering the building and sustainability of online communities of practice can be seen in Table 3.

Table 3. Challenges Hindering the Building and Sustainability of Online Communities of Practice (N = 120)

		Limited time reduces participation.	Poor connectivity hinders engagement.	Low motivation affects sustainability.	Inadequate digital skills limit involvement.	Weak leadership disrupts continuity.
N	Valid	120	120	120	120	120
	Missing	0	0	0	0	0
Mean		3.13	3.21	3.24	3.38	3.26
Std. Error of Mean		.063	.054	.056	.052	.056
Median		3.19[a]	3.23[a]	3.27[a]	3.40[a]	3.28[a]
Mode		3	3	3	3	3
Std. Deviation		.685	.593	.608	.568	.615
Variance		.469	.351	.370	.322	.378
Skewness		-.814	-.091	-.174	-.508	-.218
Std. Error of Skewness		.221	.221	.221	.221	.221
Kurtosis		1.588	-.374	-.516	1.027	-.568
Std. Error of Kurtosis		.438	.438	.438	.438	.438
Range		3	2	2	3	2
Sum		376	385	389	406	391
Percentiles	25	2.52[b]	2.58[b]	2.61[b]	2.81[b]	2.63[b]
	50	3.19	3.23	3.27	3.40	3.28
	75	3.75	3.78	3.82	3.91	3.83

a. Calculated from grouped data.
b. Percentiles are calculated from grouped data.

Table 3 indicates that the greatest challenge was poor digital skills (Mean=3.38) closely followed by poor leadership (Mean=3.26) and poor motivation (Mean=3.24). Other significant barriers were poor internet connectivity (Mean 3.21) and limited time (Mean 3.13). These results indicate that the effective construction and maintenance of online communities of practice in the contexts of professional development are hindered by both human factors, including skills, motivation, and leadership, and technological constraints.

4.2. Discussion

Results of Research Question 1 indicated that the possibility of collaboration (Mean=3.49) and the presence of a reliable internet (Mean=3.46) were key factors in the creation of online communities of practice (CoPs). This is in line with literature that revealed that collaboration and common objectives are key elements of successful community formation and professional learning (Liu et al., 2024). Conversely, shared goals were

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also significant in this study (Mean = 3.43), although some studies indicate that shared goals do not maintain community engagement without active facilitation (Kourkouli, 2022). Community formation (Mean = 3.39) also had effective leadership, which is compatible with studies that indicate that competent moderation facilitates discussion and knowledge co-construction in online professional learning communities (Kourkouli, 2022; Mompoint et al., 2022). The level of trust between members was a little bit lower, but the associated research highlights that psychological safety and mutual trust are the prerequisites of meaningful communication in digital communities.

Regular activities were found to be the most effective strategy in maintaining engagement in Research Question 2 (Mean=3.45). This observation was similar to the results that guided and coherent interaction design encourages persistent involvement in online professional environments (Edumadze & Govender, 2024). Engagement was also facilitated through feedback mechanisms, as the literature suggests that interactive scaffolding and facilitator feedback can be used to maintain active engagement within virtual classroom environments (Edumadze & Govender, 2024). Conversely, interactive tools and peer support were also moderately effective like research that has shown that technologies in certain cases may enhance engagement, but that they require pedagogically valid execution to be effective.

In terms of Research Question 3, the most significant challenge was insufficient digital skills (Mean=3.38), which aligns with studies that the lack of digital literacy is an obstacle to participation and engagement in online professional development environments (Lukashe et al., 2024). Conversely, the lack of sustainability was facilitated by weak leadership (Mean = 3.26) and low motivation (Mean = 3.24), as the existing literature indicated that a deficit of facilitation and incentives undermines CoP performance. Moreover, lack of connectivity and time is an indicator of structural barriers that have been emphasized in recent literature on digital professional learning, particularly in resource-constrained environments.

5. Conclusion

The research found that both computer and human aspects contributed to the construction and maintenance of online Communities of Practice (CoP) to facilitate professional development in tertiary institutions. It was noted that collaboration opportunities, good internet connectivity, common goals, good leadership, and trust among members are essential factors that encouraged active participation and community cohesion. Constant participation was most efficient with routine activities, positive feedback, and positive peer interaction, whereas interactive tools and appropriate content had a moderate influence on participation. Nonetheless, factors like poor digital literacy, weak leadership, low motivation, poor internet connectivity and insufficient time were found to be major obstacles which may hinder the effectiveness and sustainability of these communities. The results highlight the importance of institutions not only ensuring that their technological infrastructure is robust but also investing in the digital literacy education and leadership as well as motivating mechanisms in order to increase participation.

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All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

Data Availability

The datasets generated during and/ or analysed during the current study are available from the corresponding author on reasonable request.

Declaration on AI Use

The authors declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript.

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