

MOOCS FOR PROFESSIONAL DEVELOPMENT: DIGITAL COMPETENCE AND ATTITUDE OF TEACHERS FROM HIGHER EDUCATION

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Abstract

The social, economic, health, and environmental challenges that the world is currently experiencing call for a paradigm shift centred on sustainable development. Education is one of the most influential and infallible means to achieve sustainable development goals (SDGs). However, the quality of education systems in the world is influenced by many factors, where the quality of teachers and their professional skills play a vital role in achieving Sustainable Development Goals. In highly educated and productive societies, teachers are expected to be aware of advances and innovations in teaching, and use them for student engagement and well-being in the classroom. In this context, the use of digital technologies is proving to be effective in finding creative solutions to current challenges and promoting sustainable development. As a result, MOOCs have grown rapidly and currently represent a global phenomenon adopted by education, research, practice and policy institutions. These are widely recognized as a new form of online learning, which has recently been proposed for the professional development of teachers at various levels. As a response to the above statement, this paper describes MOOCs as means for teacher professional development as well as for developing their digital competence. This paper also delineates teachers' attitudes towards MOOCs and highlights how MOOCs are an effective and sustainable tool for acquiring the digital knowledge and skills required for the coming generations.

Keywords: SDGs, MOOCs, Professional Development, Digital Skills, Digital Competence

Introduction

Technology has an enormous impact on Indian society, with over 692 million internet users, an array of fast-growing e-platforms, and an increasingly digital-first audience. It has been recognized as a critical catalyst for change in diverse sectors, including education, which has undergone a paradigm shift in recent years. According to the World Economic Forum (2020), teaching became more mobile due to technology, triggered by the pandemic, and quality learning was now available to remote places throughout the country. Organizing, accessing, analyzing, and displaying information has changed for both students and teachers. Moreover, this transition is crucial to ensuring quality education, especially in the context of teachers' professional development. The rapidly evolving higher education landscape has also

seen the integration of technology become increasingly important. Also, MOOCs have emerged as an impressive innovation, proving capable of providing an accessible and flexible route to professional development. That is why MOOCs are experiencing hype in educational systems and are one of the most discussed topics in higher education. Since they provide flexibility in time and place, they attract scholars and learners from across the world. The advent of MOOCs has democratized access to education by breaking down geographical and financial barriers, leaving behind traditional modes of professional development. For teachers, MOOCs provide a platform to update their knowledge, learn new teaching strategies, and connect with a global community of peers. The flexibility and diversity of MOOCs make them particularly suitable for professional development, allowing teachers to learn at their own pace and tailor their learning experiences to their specific needs in order to make their teaching effective.

On the other hand, digital competence—which is the assured and critical use of information and communication technologies (ICT) for work, learning, and social participation—has been recognised as a crucial element of effective teaching in the twenty-first century. As digital technologies continue to transform the educational landscape, teachers' ability to integrate these tools into their practice is becoming increasingly important. MOOCs provide teachers with a unique opportunity to develop their digital skills while keeping up to date with the latest advances in educational technology. The purpose of this study is to examine the attitudes of teachers from higher education institutions towards MOOCs and identify the factors that influence their adoption of MOOCs and their impact on their professional skills. The aim of this research is to shed light on the advantages of adopting MOOCs among teachers from higher education institutions, which will ultimately contribute to the creation of more effective professional development strategies.

MOOCs for Professional Development

Dave Cormier and Bryan Alexander first used the phrase "Massive Open Online Courses" to describe the 2008 course "Connectivism and Connected Knowledge," which was taught by George Siemens and Stephen Downes in association with the University of Manitoba. The Introduction to Artificial Intelligence course at Stanford University, taught by Sebastian Thrun and Peter Norvig, changed the trajectory of MOOC evolution in the autumn of 2011. Coursera, another new MOOC provider, offers free online classes in partnership with leading universities. Massive Open Online Courses (MOOCs) have grown exponentially in India recently after dominating the global market in recent years, especially in higher education. As a result of the

rapidly increasing enrolment, India has established various MOOCs projects to serve their educational and professional needs. In highly educated and productive societies, teachers are expected to be aware of advances and innovations in teaching (Kumari, 2016). Therefore, MOOCs are widely recognized as a new form of online learning, which has recently been proposed for the professional development of teachers at various levels (Vivian et al., 2014; Lorillard, 2016).

MOOCs for Developing Digital Competence

Alamutka et al. (2008) state that as technology advances, the definition and substance of the term "digital competence" will continue to evolve. According to Ilomäki et al. (2011), digital competence is a notion that describes technological proficiency and evolves, renews, and transforms with the times. With MOOCs, the innovative teaching methodologies such as flipped classes, gamification, and project-based learning are rather common, which teachers get to experience and then can apply in their own practices. MOOCs are pretty interactive with discussion forums, group projects, and peer feedback that include aspects which urge collaboration and communication; this will help teachers enhance their digital communication skills and professional networking. With their numerous, flexible, and specialised learning options, MOOCs will significantly aid in the development of teachers' digital competency.

Online courses like these include both computer skills and advanced educational technology integration for technologically literate teachers, enabling them to appropriately and effectively use digital tools in the learning process. MOOCs also engage teachers in practically working with a great number of digital platforms and software, smoothing their skills of navigating and managing virtual learning spaces. Regular use of MOOCs lets the teacher stay updated with the current trends in educational technology since their digital skills are constantly relevant. Many MOOCs provide certification upon completion, which is useful in their professional development and career promotion.

Put another way, MOOCs are a very different kind of online learning than traditional or virtual classrooms, where in a university, college, or other educational institution, face-to-face interactions between a small number of students who share a common age and location are crucial elements. There are many different online reading materials and resources available in it. Mass learning can benefit from the flexible, affordable, anytime, anywhere learning that MOOCs offer. Analysing the process of preparing teachers in higher education institutions for this new mode of instruction on a massive scale would be consistent. A study in this particular aspect is very essential to know the Attitude of higher education teachers and also to know

whether they are comfortable in getting trained through MOOCs, do they realize themselves to be digitally fluent enough to learn through MOOCs and whether MOOCs helps them to develop their digital competence.

Theoretical Framework

This research is based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model developed by Venkatesh et al. (2003). In Fig. (1) UTAUT posits that an individual's intention to adopt a technology is influenced by four key constructs given in the following fig.1.

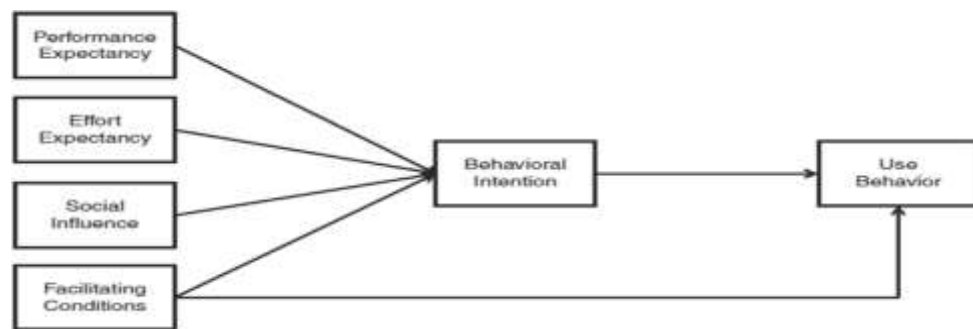


Figure 1: UTAUT model proposed by Venkatesh et al. (2003)

In the context of this study, UTAUT was adapted to explore the adoption of MOOCs for professional development among teachers from higher education. Here is how the key constructs translate:

- **Performance Expectancy:** This relates to teachers' belief that MOOCs will improve their teaching skills and knowledge, leading to better student outcomes.
- **Effort Expectancy:** This focuses on teachers' perceived ease of navigating and using the MOOC platform, including their comfort level with technology and learning management systems.
- **Social Influence:** This considers the role of colleagues, administrators, or professional organizations in encouraging or discouraging MOOC adoption.
- **Facilitating Conditions:** This refers to the availability of institutional support, such as dedicated time, technical assistance, or financial resources, to complete MOOCs.

Additionally, two exogenous variables were integrated into the framework:

1. **Digital competence:** This refers to teachers' knowledge, skills, and abilities related to using digital technologies for learning and teaching. Higher digital competence is expected to

positively influence all four main UTAUT constructs, making MOOC adoption more likely.

2. **Teacher attitudes:** This variable encompasses teachers' overall perceptions and beliefs toward MOOCs as a tool for professional development. Positive attitudes are expected to boost performance expectancy, reduce perceived effort, and increase receptivity to social influence.

Significance of the research study

The study's findings on MOOCs adoption in higher education hold important implications for various stakeholders. For educators, this research may uncover factors influencing their decision to engage with MOOCs for professional development. By identifying barriers and facilitators, the study may inform the design of targeted support programs and interventions to enhance digital literacy/competence and pedagogical skills. Higher education institutions can leverage the findings to optimize their professional development strategies, allocate resources effectively, and create supportive learning environments that promote MOOCs use. In addition, MOOCs providers can benefit from the research by gaining insight into the priorities, needs, and challenges faced by higher education faculty. This knowledge may be helpful in tailoring MOOCs content, delivery, and support services to better align with educators' professional development goals. In the end, this study adds to the body of knowledge on how technology is integrated into education and provides policymakers, researchers, and practitioners who want to make online learning more effective with useful insights.

Objectives of the study

The aim of the study revolves around the research question 'How does digital competence and attitudes influence the adoption of MOOCs for professional development among higher education teachers?' Research objectives of the study are:

1. To investigate the level of digital competence among higher education teachers.
2. To examine the attitudes of higher education teachers towards MOOCs.

Research Methodology

This present research study is descriptive in nature where researchers used survey method to know the Attitude of teachers from HEIs towards MOOCs for professional development as well as their level of digital competence.

Tool of the study

For studying the attitude of teachers from higher education towards MOOCs for professional development, items of the questionnaire were framed by the researchers themselves based on

previous research studies. Total 18 items were framed based on Likert Scale with the responses options as 1=strongly Disagree, 2=Disagree, 3 = Agree, 4= Strongly Agree. Responses were collected using google form and were shared via WhatsApp and Telegram in many groups.

For studying digital competence among teachers from higher education, researcher developed a questionnaire based on The Digital Competence Framework for Citizens (DigiComp 2.2) in 5 different areas (Dimension) 1. Information and data literacy 2. Communication and Collaboration 3. Digital content Creation 4. Safety and 5. Problem Solving. Total 20 items (4 in each dimension) were developed to study the level of digital competence among teachers from higher education institutions.

Sample of the study

Teachers from higher education institutions were selected for the study to know their attitude towards MOOCs for professional development. Total 102 participants voluntarily participated in the study. They were from different institutions like Government, Government Aided and Private institutes.

Result and Analysis

Personal Information of Participants

Total 102 participants voluntarily participated in this study in which 78 were male and 24 were female participants. Fig.2 depicts the percentage of teachers as per the institutions as Govt., Govt. Aided and Private Self-Financing. Out of 102 participants 20.6% teachers are from Government institutions, 41.2% participants are from Government Aided institutions, and 38.2% teachers are from private/self-financing institutions.

Based on different types of Institutions

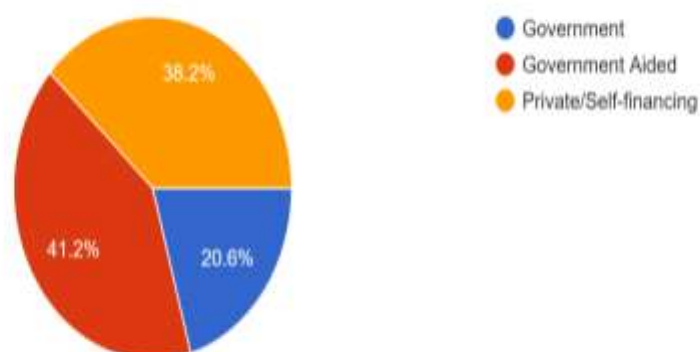
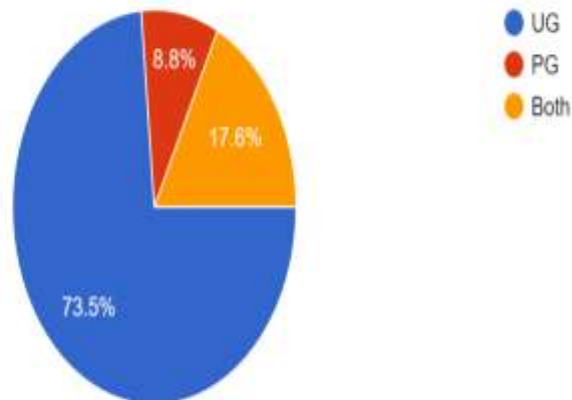


Figure 2: Teachers from different types of institutions

Fig. 3 depicts that out of these 102 participants 8.8% were teaching in PG classes, 17.6% were teaching UG Classes and the rest of 73.5% teachers were teaching both UG and PG classes both.

Based on Classes Taught

Figure 3: Classes taught by Participants



Based on Different Stream

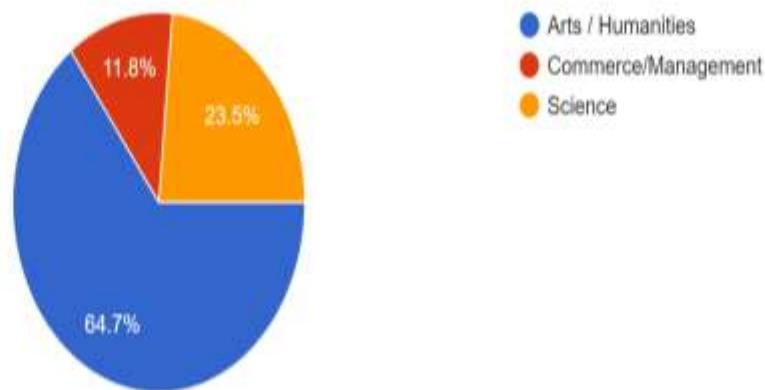


Figure 4: Participants from different streams

Fig 4 depicts that 64.7% teachers were from Arts & Humanities; 23.5% teachers were from Science stream while 11.8% teachers were from Commerce and Management streams. Based on the questionnaire we received below mentioned responses by the teachers from higher education institutions.

Table 1: Responses received from the Teachers of Higher Education Institutions

Item No.	Items	Strongly Disagree	Disagree	Agree	Strongly Agree
1	MOOCs can improve my job performance.	2	1	28	71
2	MOOCs can improve my knowledge and skills.	0	3	23	76
3	Overall, Professional development through MOOCs can improve the quality of education	0	06	28	68
4	I feel positive about using MOOCs to further my skills and knowledge.	0	06	08	84
5	MOOCs can give me the same quality of knowledge and skills as face-to-face learning.	06	07	29	60
6	I would like to learn from MOOCs developed by Indian as well as foreign universities.	0	15	35	66
7	Learning through MOOCs is superficial.	24	27	26	25
8	MOOC qualifications are acceptable and recognized by my professional organization/body.	3	3	59	37
9	I would encourage my colleagues to try MOOCs for their professional development.	3	8	31	60
10	It is more cost-effective to take a MOOC than a traditional course.	6	7	27	62
11	My main reason for registering for the MOOC was to gain greater autonomy as a learner	4	2	35	61
12	MOOCs propose up-to-date topics and information.	4	2	29	67
13	The training offers through MOOCs is diverse and covers the most specific training needs	6	5	34	57

14	One can choose MOOCs offered by various educational institutions (foreign universities, organizations).	11	4	31	56
15	One may acquire the necessary competencies for professional development by taking MOOCs.	3	6	51	42
16	MOOCs help teachers (HEIs) to develop professional competencies.	2	4	41	55
17	Through MOOCs we can collaborate easily with colleagues (similar academic background) across the globe.	2	7	28	65
18	MOOCs promote lifelong learning.	0	6	42	54

Based on Table 1, the data from the survey holds a good inclination toward MOOCs for professional development, where 99% of respondents agreed that MOOCs can improve job performance and 99% agreed that MOOCs enhance knowledge and skill. Further, 96% feel MOOCs for professional development can help in improving the quality of education while 92% of the respondents show a positive attitude towards the usage of MOOCs for enhancing skills and knowledge. While 89% agree that MOOCs provide as good quality of knowledge and skills acquisition like face-to-face learning, 13% believe otherwise.

MOOCs have attracted a high level of interest by both male and female teachers, as several feel that 66% strongly agree, although about 35% agree. MOOCs promote superficial learning: although 51% disagree, 49% are of the opinion that learning via MOOCs may not be deep enough. Further, 96% believe MOOCs are appropriate and recognized by professional organizations, and 91% would recommend that their colleagues use MOOCs for professional development. When asked about the cost-effectiveness of MOOCs, 89% found them more economical compared to conventional courses. High levels of agreement were observed in statements like the fact that MOOCs provide updated topics of interest and information with a percentage rate of 96%, and that MOOCs provide diversified training answering specific needs 91%. 93% of the total respondents support the fact that there is a possibility to gain competencies necessary for professional development through MOOCs, while 96% agree with the statement that MOOCs promote lifelong learning.

Table 2: Comparison of male and female teachers towards digital competence

Dimensions of Digital Competence	Mean		t- value	Significance
	Male	Female		
1. Information and data Literacy	3.72	3.69	-.25	0.82
2.Communication & Collaboration	3.46	3.41	.97	0.45
3. Digital content Creation	3.79	3.54	2.22	0.04
4. Safety	3.46	3.41	.77	0.45
5. Problem Solving	3.24	2.57	2.62	0.01

Table 2 shows that there were significant differences between male and female teachers with regard to digital competence facets in these higher education institutions. An independent t-test comparing the mean scores of the female and male teachers on digital competence facets found a significant difference between the mean scores of two groups in Problem Solving and Digital Content Creation ($t(100) = 2.62, p = 0.01$), ($t(100) = 3.79, p = 0.04$). This indicated that male teachers might have a higher perceived ability in digital content creation and also suggested that male teachers feel more competent in digital problem-solving than their female counterparts. The mean scores of males were significantly higher than those of females in all facets of digital competence. On the other hand, the mean scores are almost identical (Male: 3.72, Female: 3.69) with a t-value of -0.25, indicating no significant difference in information and data literacy between male and female teachers. Both genders have similar mean scores (male: 3.46, female: 3.41), and the t-value of 0.97 suggests no significant difference in communication and collaboration skills. Both male (3.46) and female (3.41) teachers have similar perceptions of safety in digital environments, with a t-value of 0.77 indicating no significant difference.

Recommendations

The result of the study gives significant insight into the attitude towards Massive Open Online Courses for professional development as well as for developing digital competence among Teachers from HEIs. Based on the findings, it is recommended that MOOCs focus on

enhancing the depth of learning by incorporating more interactive and practical content to address concerns about superficiality. Increasing awareness of MOOCs quality through testimonials and showcasing successful outcomes can help build confidence among educators. Targeted support and training programs should be developed to improve digital content creation and problem-solving skills, particularly for female educators, to bridge the identified competence gap. Promoting the formal recognition of MOOCs qualifications by professional bodies will further enhance their credibility and acceptance.

Encouraging global collaboration through MOOCs and integrating them into professional development plans can broaden perspectives and networks, benefiting educators and institutions alike. Given the strong recognition of MOOCs in promoting lifelong learning, educational institutions and employers should encourage continuous education by actively supporting participation in MOOCs. Overall, while these are widely accepted and valued for professional development, addressing these areas can optimize their effectiveness, ensuring they meet the diverse needs of educators and contribute to improving the quality of education. But the higher education authorities should come forward and decide to organize more workshops and capacity building programs related to computer applications and educate them about the development of massive open online courses as well as promote digital literacy/competence among teachers, especially female teachers of higher education institutions. This will help teachers to gain extensive knowledge in the specific field, develop a new skill as well as understand MOOCs and its great benefits.

Conclusion

This study suggested that MOOCs have a wide acceptance and perceived value for professional development, enhancement of knowledge, and lifelong learning. Most educators find MOOCs useful to support improvement in their job performance, get recent and multi-discipline training, and cost-effective solutions to learning. Areas of further improvement included developing the perceived depth of learning and giving universal recognition to the qualification a MOOCs provide. Also, the data indicates a gender gap in digital skills, more specifically concerning the creation of digital content and problem-solving. These results seem to indicate targeted training programs for women educators. Consequently, it is clear that improved versions, which take care of these issues, will place MOOCs at a better position to serve the changing needs of educators and at the same time assure quality education in different settings.

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