Educational Quest: An Int. J. of Education and Applied Social Sciences: Vol. 16, No. 02, pp. 179-187, August 2025
DOI: 10.30954/2230-7311.2.2025.10
Peer Reviewed Journal

Knowledge, Attitude, and Practice (KAP) Study on MOOCs among Students of Teacher Education

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Received: 13-06-2025 **Revised:** 22-07-2025 **Accepted:** 03-08-2025

ABSTRACT

Awareness of Massive Open Online Courses (MOOCs) through KAP study in India has provided a deep insight into the perception of students of teacher education in a three-dimensional way. The current investigation examines the degree of awareness of MOOCs among students pursuing teacher education in state, private, and central universities in Central and Eastern India. Knowledge, Attitude, and Practice (KAP study) were employed in higher education institutions throughout central-eastern India to examine the awareness of MOOCs among B.Ed. and M.Ed. students. Descriptive statistics, as well as chi-square, were carried out to analyze students' perceptions. The study's findings showed that teacher education students at central, state, and state-private universities in Eastern India did not have proper information and awareness; therefore, their attitude towards MOOCs does not positively affect their practice. The chi-square test of association does not significantly associate concerning the nature of the university.

Keywords: SWAYAM, MOOCs, Teacher Education, Awareness, Higher Education, KAP study

The massive outbreak of COVID-19 challenged the traditional educational system of the globe to continue the educational process in an explosive way. Therefore, synchronous and asynchronous modes of digital online education came to occupy the gap. Since COVID-19, various online platforms have become popular, such as MOOCs. Massive Open Online Courses, or MOOCs, are a popular kind of blended learning that is currently popular in the educational community (Shaikh, 2017). All students throughout the world have access to a wide range of excellent educational resources through MOOCs (Liu *et al.* 2015). With their free or inexpensive resources, MOOCs can prove to be a financially advantageous alternative for students to learn, particularly in poor nations like India, where educational resources are not readily available (Kennedy, 2014). Therefore, a developing nation like India can benefit from MOOCs because of its freemium business model. Students can choose any course they're interested in from the enormous assortment of online courses given by MOOCs at their own pace, time, and location and can earn credentials with little work (Jrall & Gupta, 2021). In this situation, the Government of India launched "SWAYAM" (Study Webs of Active-learning for Young Aspiring Minds) with the goal of bridging the digital divide for students and integrating them into the knowledge economy, keeping this in mind as well as maintaining balance with worldwide educational trends (www.swayam.gov.in). Even though it is a more recent development in India than in Western countries, stakeholder awareness is still insufficient. The implementation of MOOCs is said to be in its early stages in India. Hence, it

How to cite this article: Mondal, K., Parhi, R.K. and Panda, B.K. (2025). Knowledge, Attitude, and Practice (KAP) Study on MOOCs among Students of Teacher Education. *Educational Quest: An Int. J. Edu. Appl. Soc. Sci.*, **16**(02): 179-187.

Source of Support: None; **Conflict of Interest:** None

is crucial to familiarize teachers with these online courses (Chauhan, 2017). According to Shaikh (2017), numerous courses are offered through the SWAYAM portal, but students aren't signing up for them. Students must be encouraged to use online learning instruction in this day and age, and also, there is a need for an awareness program.

India has a very high enrolment rate in SWAYAM MOOCs compared from its early years, although only about 5% of students complete their degrees (www.swayam.gov.in). Because some students might not care about receiving credit and merely want to learn the fundamentals. Others may anticipate the acquisition of higher-order skills, including problem-solving aptitudes, mental models, and a drive for lifelong learning, as well as the expansion of social networks and/or entry into formal education (Van Hentenryck & Coffrin, 2014). Therefore, there is a need for a KAP (Knowledge, Attitude, and Practice) study to know the real facts of the low completion rate of SWAYAM MOOCs.

Advent and growth of massive open online course (MOOC)

Massive Open Online Courses (MOOCs) are new technology advancements in the educational sector of the first decade of the twenty-first century. and Dave Cornier initially popularized this concept in 2008 with Bryan Alexander (Nisha & Senthil, 2015) and has gained notoriety in the field of distance learning since 2011 (Fan & Yu, 2017). Connectivist MOOCs (cMOOC), Expanded/Extension MOOCs (xMOOC), and Hybrid MOOCs (hMOOC) are the three different types of MOOCs (Lugton, 2012).

Indian MOOCs initiatives

The Indian government has taken the majority of actions involving open education and open resources in the first and second decades of the twenty-first century to make it accessible to everyone. In order to provide online courses in computer science, electrical, mechanical, and ocean engineering, management, the humanities, music, and other fields, the Ministry of Human Resource Development (MHRD) launched a joint venture project called NPTEL (National Programme on Technology Enhanced Learning) with seven Indian Institutes of Technology (IITs) and the Indian Institute of Science (IISC) in 2003. Then, in 2014, IIT Kanpur (IITK) created MooKIT, and at the same time, IIT Bombay created the IITBombayX platform using the open-source platform Open edX (Chauhan, 2017). After these initiatives Ministry of Human Resource and Development (MHRD) strives to strike a balance between tradition and global modern educational practices and then started the project "*Study Webs of Active Learning for Young Aspiring Minds*" (SWAYAM) in keeping the philosophy to provide access to the best learning resources nationwide through online/blended mode. A mobile device, tablet, laptop, or desktop computer with an interactive internet connection can be used to access SWAYAM, an Indigenous one-stop online portal which offers online and blended courses from the school level to post-graduate level. Anyone who wants to improve their academic performance can enroll in the SWAYAM site and select the right courses from a vast selection. Whole courses have adopted the four-quadrant method (e-Tutorial, e-Content, Web Resources, and Self-Assessment). Following course completion, students may transfer credits or obtain certificates for a minimal price (MHRD, 2017).

Literature review

Approximately 87.5% of enthusiastic students chose MOOCs to participate in MOOCs, primarily to increase career opportunities, to learn from a specific expert, to learn better than in-person courses or other online courses, and to receive a certificate (Liu *et al.* 2015). It means students had knowledge about MOOCs and its function. But in case of real practice only 5.6% of the B.Ed. and M.Ed. students fulfilled all the prerequisites and paid the fee to obtain their certificate (Shaikh, 2017) and findings showed that although the majority of students were familiar with how to use computers and smartphones with internet access, and 90% of them knew what MOOCs were, but knowledge of ten other areas regarding MOOCs was relatively low. To explore students' involvement in MOOCs, Almutairi & White (2018) created a model based on nine attributes and found that these attributes strongly measured students' engagement at the 0.05 level. Whereas Sivakumar's (2019) study reflected that due to lack of a fundamental grasp of MOOCs and SWAYAM and the ambiguous nature of their role in teacher training, students' and teachers

were found to have insufficient knowledge of both. Monicka & Jayachithra (2019) found differences based on the study's exploration and comparison of graduate and postgraduate student teachers' attitude and awareness towards MOOCs among students from the arts and sciences as well as rural and urban student populations. Additionally, it was discovered that science student teachers are more aware than humanities students. Sera and Lobo (2019) investigated the user experience and challenges faced by Postgraduate students in the Belthangady Taluk and discovered that 79% of the students are enrolled, but 40% of the respondents had faced troubled in navigating the interface, while 26% had trouble with breakdowns, and 34% have trouble logging in. Additionally, 30% of the respondents anticipate a fee reduction. According to Kumar (2019), 43% of Veterinary Scholars finished the course, 47% only partially completed it, and 9% never enrolled in the course, but 99% showed interest in the online discussion forum. Adebayo & Babalola (2021) asserted on three dimensions - potentials/benefits, engaging in MOOCs, and various forms of MOOCs - it was discovered that undergraduate law students in Osun State had a typically low understanding of MOOCs but interest to use was high. Rodriguez *et al.* (2020) discovered that a MOOC's duration affects student engagement, retention, and completion rates. Six-week courses had a completion rate of 15.60%, while two- and three-week courses had a completion rate of 61.82%. Kundu & Bej (2020) found that science students at Indian state universities had higher levels of awareness than students majoring in arts, social science, or law. Postgraduate students also displayed higher levels of awareness than undergraduate students. Additionally, it was discovered that while student interest in enrolling is strong, satisfaction was low. Shao & Chen (2020) based on the empirical research of perceived active control, perceived synchronicity and perceived two-way communication in MOOCs, it was found that these three attributes positively correlated with individuals' intention to continue taking MOOCs and had a gender effect. Females prefer active control and two-way communication, while males prefer synchronicity and task. Purkayastha & Sinha (2021) mainly focused on the awareness level of MOOCs among postgraduate level library science students of Asam and Silchar University and discovered that 71.4% students were aware of SWAYAM but most of the students were uninformed of MOOCs courses which can be taken for credit transfer and 50% students choose face-to-face mode of learning over online learning. In their study, Subaveerapandiyan and Ali Ahamed (2021) discovered that while 83.33% of higher education students from five universities were aware of using SWAYAM MOOCs and had enrolled in courses, their level of satisfaction with video lectures, content, and appropriate courses for their degree programs was surprisingly low. According to Jrall and Gupta (2021) among teacher educators in the Jammu division, 73.91% of females and only 50% of males are aware of SWAYAM MOOCs. However, both sexes (100%) know that various learning materials in various formats are available in MOOCs, and they both download these materials for their own educational purposes.

The existing literature only expressed empirical data regarding awareness, practice, challenges, and success rate. However, no single study concludes the result based on knowledge, attitude, and practice. KAP study provided a clear and concrete result rather than a single study, which only focused on knowledge awareness, perception, attitude, practice, or active engagement. Therefore, there is a need for a concrete study that can reflect the actual result based on the same respondents' knowledge, attitude, and practice on awareness of MOOCs. KAP study focuses on a cross-sectional matrix to find the base problem. In this way the present investigation is different and able to add new knowledge in this context.

Significance of the study

SWAYAM MOOCs are the sole way for people in India to get access to high-quality, reasonably priced education without having to pay for infrastructure or overcome age, location, or time barriers. Additionally, the teacher-student ratio is still not maintained in every institution, and there is still a shortage of effective, skilled, and technologically advanced teachers. Thus, through enhancing accessibility and openness, Massive Open Online Courses (commonly abbreviated as MOOCs) have emerged as a bridge between the digital divide and cutting-edge educational concepts. Low success rates or high dropout rates, however, remain the

most vexing problems. This makes it a relevant strategy that has to be verified. As a result, the researcher expressed a strong interest in researching teacher education students' awareness of SWAYAM MOOCs through the KAP study.

Research questions

1. What is the status of Knowledge of SWAYAM MOOCs among teacher education students of Central, State, and State Private Universities?
2. What Attitude is possessed among teacher education students of Central, State, and State Private Universities on SWAYAM MOOCs?
3. What is the status of the Practice of SWAYAM MOOCs among teacher education students of Central, State, and State Private Universities?
4. Is there any correlation between the knowledge and attitude of students of teacher education towards MOOC practice?

Hypothesis

The following hypotheses were framed based on the study.

$H_0$1 There is no significant difference among central, state, and state private university teacher education students' knowledge of SWAYAM MOOCs.

MOOCs participate in MOOCs primarily to increase career opportunities, to learn from a specific expert, to learn better than in-person courses or other online courses, and to receive a certificate (Liu *et al.* 2015). Shaikh (2017) found that most (90%) of teacher education students knew what MOOCs are, but knowledge of ten other areas regarding MOOCs was relatively low.

$H_0$2 There is no significant difference among central, state, and state private university teacher education students' attitudes toward SWAYAM MOOCs.

Almutairi & White (2018) measured the students' involvement in MOOCs based on attributes and found that attributes strongly measured students' engagement at 0.05. Another study by Monicka & Jayachithra (2019) found differences among graduate and postgraduate student teachers' attitudes and awareness towards MOOCs.

$H_0$3 There is no significant difference among central, state, and state private university teacher education students' engagement in SWAYAM MOOCs.

According to Kumar (2019), 43% of Veterinary Scholars finished the course, 47% only partially completed it, and 9% never enrolled, but 99% showed interest in the online discussion forum. Another study by Subaveerapandiyan and Ali Ahamed (2021) showed that while 83.33% of higher education students from five universities were aware of using SWAYAM MOOCs, their level of satisfaction was surprisingly low.

$H_0$4 There is no significant joint contribution of MOOC knowledge and attitude in predicting MOOC practice among students of teacher education.

METHODS

Study Design

The current study was carried out using the descriptive survey method to determine the awareness of SWAYAM MOOCs among teacher education students at central, state, and private universities based on knowledge, attitude, and practice.

Participants and Sampling Technique

According to the University Grant Commission's document, India has 432 private universities, 128 deemed to be universities, 54 central universities, and 464 state universities as of 31 March 2023. For the current study, the researcher randomly selected 24 institutions from West Bengal, Bihar, Odisha, Jharkhand, Tripura, Asam, Meghalaya, and Chattisgarh, including central universities, state universities, and state private universities. The letters CU1, CU2, CU3, CU4, C5, C6, C7, and C8, which stand for central universities; SU1, SU2, SU3, SU4, SU5, SU6, SU7, and SU8; and SPU1, SPU2, SPU3, SPU4, SPU5, SPU6, SPU7, and SPU8, which stand for state private universities, have been used to symbolize the names of the universities. For reasons of ethics, the researcher kept this a secret. Graduate (B.Ed.) and postgraduate (M.Ed.) teacher education students are the study's target audience. To obtain the target sample, we used the stratified random sampling technique. To collect data, the researcher selected 200 M.Ed. students from three central, three state, five state private universities or colleges, and 25 B.Ed. students from each central, state, and state private university. Thus, the whole sample comprised 200 + 200 + 200 + 75 + 75 + 50 = 800.

In this study, the researcher used a survey method and a straightforward stratified random sampling procedure to gather data from randomly chosen central, state, and state-private institutions in Middle and Eastern India over eight months, from January 2022 to August 2022. Data were collected via email, WhatsApp, Facebook, and face-to-face interactions depending on the circumstances. A structured, closed-ended survey questionnaire was distributed to 1200 participants by the researcher, and respondents were asked to rate the statements on a five-point Likert scale to avoid forced-choice bias. The researcher got 450 responses from the online survey; the rest were collected face-to-face.

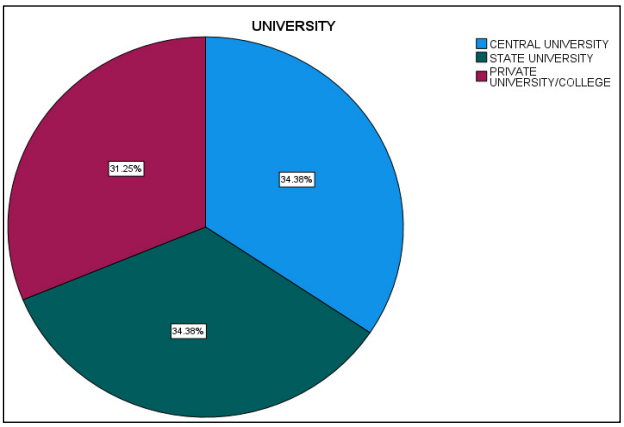

Fig. 1: Pie Chart of Demographic Information

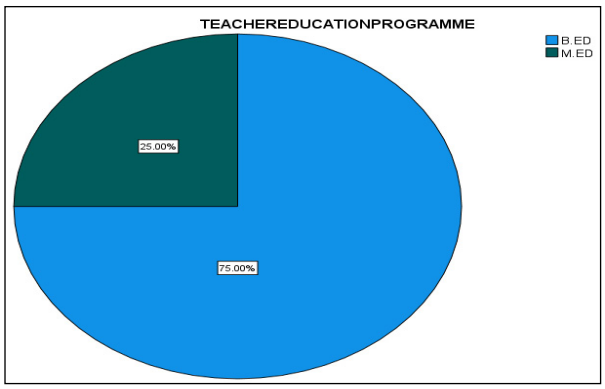

Fig. 2: Pie Chart of Demographic Information

Measurement Instrument

Self-developed, structured, closed-ended survey questionnaire on a five-point Likert scale to avoid forced-choice bias. The tool consisted total of 20 closed-ended statements based on knowledge, attitude, and practice on awareness of SWAYAM MOOCs.

To test the efficacy and validity of the self-created closed questionnaire, the researcher conducted a small survey among 170 teacher education students and established the reliability and validity of the questionnaire.

Reliability Statistics	
Cronbach's Alpha	N of Items
.806	20

Fig. 3: Reliability Test

Data analysis

Descriptive data, such as percentages and graphic representations, and the 'chi-square' tests and multiple correlation coefficient have been utilized to draw a general picture of SWAYAM consciousness among teacher education students using KAP study. Data has been analyzed using Microsoft Excel 2021 and IBM 27.

RESULTS AND FINDINGS

Descriptive statistics (Means and Standard Deviations [SD]) by item within each of the three subscales are presented in Tables 1,2,3.

Table 1: Status of Knowledge Regarding SWAYAM MOOCs

According to the descriptive table (Table 1) above, students enrolled in teacher education programs at central, state, and private universities expressed a favorable opinion of the university based on their knowledge of SWAYAM MOOCs. Their overall mean score was 3.10 (SD = 1.235) on MOOCs offered in India; 2.53 (SD = 1.283) on what SWAYAM MOOC is; 2.93 (SD = 1.227) on various relevant courses; 2.95 (SD = 1.200) on teaching-learning transactions; 3.05 (SD = 1.220) on the examination system; 2.64 (SD = 1.107) on certification procedures; 2.69 (SD = 1.122) on the four quadrants; and 3.05 (SD = 1.565) on monitoring progress. The result showed that knowledge and awareness were more highly in three aspects: MOOCs offered in India, the examination system, and the process of checking progress. Teacher education students demonstrated more knowledge towards MOOCs offered in India. However, they showed slightly lower mean ratings for the process of enrollment.

Table 2: Attitude Toward SWAYAM MOOCs

According to the descriptive table (Table 2) above, SWAYAM MOOCs were viewed favourably by teacher education students at central, state, and private universities. Their overall mean score was 3.05 (SD = 1.220) for willingness to enroll in MOOCs in future; 2.96 (SD = 1.298) for satisfaction with enrolling, 2.68 (SD = 1.143) for satisfaction with course materials, 2.64 (SD = 1.060) for satisfaction with evaluation system; 2.81 (SD = 1.153) for the four-quadrant system; The outcome demonstrated that opinions were more favorable in one area: willingness to enroll in MOOCs available in India. On the other four dimensions, were comparatively low.

Table 3: Practice Towards SWAYAM MOOCs

Teacher education students at central, state, and private institutions showed comparatively little use of SWAYAM MOOCs, as seen by the descriptive table (Table 3) above. The results showed that practice was relatively low for SWAYAM MOOCs in India. Their overall mean score was 2.89 (SD = 1.091) for those who were already enrolled in the MOOCs, 2.71 (SD = 1.150) for course materials, 2.54 (SD = 1.245) for expectation on evaluation, 2.68 (SD = 1.306) for experiencing difficulties accessing course materials; and 2.35 (SD = 1.224) for actively participating in discussion forums; 3.07 (SD 1.486) for checking progress regularly; 2.97 (SD=1.256) for perception on four quadrants.

In this section below, the researchers analyze obtained responses according to specific research hypotheses. The chi-square test of association within each of the three subscales is presented in the table.

The above Pearson Chi-Square test of association table (Table 4) showed that the nature of universities, i.e., central, state, and state private universities, had an association towards knowledge, attitude, and practice on awareness of SWAYAM MOOCS among students of teacher education program.

Table 4: Chi-Square Test of Association Pearson Chi-Square

Knowledge		**Value**	**df**	**Asymptotic Significance (2-sided)**
1	I know about MOOCs offered in India.	49.034	8	<.000
2	I know what SWAYAM MOOCs is.	36.960	8	<.000
3	I know the various courses offered on SWAYAM for the teacher education program.	179.704	8	<.000
4	I know the teaching-learning transaction system in SWAYAM.	174.713	8	<.000
5	I know the evaluation system of SWAYAM.	160.338	8	<.000
6	I am not aware of SWAYAM's certification system.	130.208	8	<.000
7	I know four quadrant systems in SWAYAM.	130.830	8	<.000
8	I know how to check my progress in the profile menu.	234.242	8	<.000
	Attitude	Value	df	Asymptotic Significance (2-sided)
9	I would like to enroll in another course through SWAYAM portal.	160.338	8	<.000
10	Are you satisfied with enrolling in the SWAYAM MOOCs course?	62.431	8	<.000
11	Are you satisfied with the course materials of the SWAYAM course?	153.963	8	<.000
12	Are you satisfied with the evaluation system of SWAYAM?	123.926	8	<.000
13	The four-quadrant method is very much helpful to me.	174.079	8	<.000
	Practice	Value	df	Asymptotic Significance (2-sided)
14	I have already enrolled in SWAYAM MOOCs.	188.461	8	<.000
15	Course materials are good enough for preparation for the final exam of SWAYAM.	216.994	8	<.000

16	Have you gotten the expected grade after the evaluation?	48.915	8	<.000
17	I have faced problems while accessing course materials.	54.799	8	<.000
18	I have actively participated in discussion forums.	69.445	8	<.000
19	Have you ever checked your progress in the profile menu?	280.628	8	<.000
20	Do you think the four-quadrant method needs to be modified?	330.236	8	<.000

Table 5: Joint contribution of MOOC knowledge and attitude in predicting MOOC practice among students of teacher education

Variables	$R_{1(23)}$	Remarks
Practice, Knowledge, Attitude	0.976	P< 0.05

Table 6: Model Summary

Model	R	R Square	Adjusted R square	Std. Error of the Estimate	Change statistics				
					R square change	F change	Df1	Df2	Sig f change
1	.976	.953	.953	4.284	.953	8023.443	2	798	.000

This result was in line with Shakya *et al.* (2016), who discovered that MOOCs are poorly understood by students and teachers in various nations, including those outside of India**.**

From the table 5&6, it is evident that the multiple correlation coefficient is .976, which is significant at 0.05 level with a degree of freedom equal to 2/798. It indicates that, there is a significant joint contribution of MOOC's knowledge and attitude in predicting MOOC's practices. In this context, the null hypothesis that there is no significant joint contribution of knowledge and attitude in predicting practice is rejected. Further, the multiple correlation coefficient is .976, and the percentage of the joint contribution of knowledge and attitude in predicting practice is 97.6, which is quite high. Therefore, it may be said that knowledge and attitude jointly can contribute to the prediction of practice.

Discussion

This study, conducted at central, state, and state private-owned universities in Middle Eastern India, investigates the level of various viewpoints on awareness based on the KAP study of the SWAYAM platform among teacher education students. The researchers investigated the degree of knowledge, attitude, and practice and their correlation, and it was found from the descriptive statistics that teacher education students' knowledge was relatively high, but the attitude was low, though willingness to enroll in MOOCs was high, which is in line with the findings of Liu *et al.* (2015) and Kundu & Bej (2020). On the other hand, teacher education students at central, state, and private institutions showed comparatively little use of SWAYAM MOOCs, which contradicts with the findings of Almutairi & White (2018).

The chi-square tests proved that knowledge, attitude, and practice are not independent with respect to the university. Therefore, it can be concluded that the universities' nature was associated with the promotion of MOOC knowledge, attitude, and practice. The outcome suggests that the university and its faculties did not appropriately encourage students of teacher education for MOOCs on the SWAYAM platform, which was also found by Shaikh (2017).

The multiple correlation coefficient's result suggests a strong joint contribution of knowledge and attitude towards practice. The result of the correlation suggested that increasing knowledge and attitude jointly increases the practice and vice-versa.

Recommendation

The analysis revealed that low knowledge and attitude negatively impact their enrolment, completion, and retention rates. Hence, the following measures may be suggested to prevent these problems and improve teacher education students' enrollment in MOOCs.

1. There is a need for regular seminars and workshops focused on Massive Open Online Courses (MOOCs) and their efficacy inside higher education institutions.
2. Both faculty and students should have actively encouraged and facilitated participation in MOOCs.
3. MOOC providers should prioritize providing credit courses that align with the proficiency level of their participants.
4. Discussion forums should be active, i.e., immediate reply mechanism must needed in the course of time.
5. Universities ought to have furnished their students with information regarding credit transfer.

MOOCs for strengthening open and Distance Learning

According to McCarty (2003), self-organizing systems have developed with two main traits: openness and self-reference, and they are agile. These traits have been highlighted in open and distance learning. As a system becomes more self-sufficient and gains new capabilities that boost its resourcefulness, it becomes more transparent with its surroundings if it actively seeks out information and makes that information widely available inside the system. The capacity to relate back to fundamental concepts is a second feature of self-organizing systems (Wheatley, 1999:85). Massive open online courses (MOOCs) centered on these two ideas: openness and online learning with huge materials and course modules. An adaptable digital learning system, as used in massive open online courses (MOOCs), is one that can modify to better fit the learner based on data acquired during the learning process rather than data already stored in the system. MOOCs an integral part of open and distance learning (ODL) is self-directed learning, which may be facilitated through adaptive instruction's ties to customized, differentiated, and individualized learning. Educators who want to do a good job of helping their students learn need to put in a lot of time and energy, have a lot of expertise, and have access to a wide range of resources that cover a lot of ground in terms of difficulty. These methods taught students a set of abilities in a specific order, with the goal of having them fully grasp one ability before moving on to the next. Despite tailoring each student's learning time to their specific requirements, these mastery learning programs nonetheless taught the same content in the same way to every single student. Thereby, massive open online courses (MOOCs) can bolster ODL.

CONCLUSION

This study seeks to ascertain how much teacher education students in Middle Eastern Indian central, state, and state-owned private colleges are aware of MOOCs by assessing their perceptions. The results show the lack of knowledge about MOOCs among students in teacher education and the low level of attitude on how to influence practice. Findings of the results also revealed that the degree of knowledge, attitude, and practice vary depending on the type of university to some extent. However, people, especially in developing nations, are worried about the lack of accessibility and inclusivity caused by the high degree of computer literacy required to participate in MOOCs (Nyoni, 2013).

Limitation

The study does have some constraints. Due to institutional contexts, regional characteristics of the state, program of study, and platforms used in the current study, the findings may not be applicable to explain or compare the level of awareness about MOOCs elsewhere. The study was conducted on teacher education students (B.Ed. and M.Ed.) who were from central, state, and state private universities in Middle Eastern India. In addition, connections that support the discussed criteria might exist but not have been looked at in the current study, providing a new area of investigation for future research.

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