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Level of e-Learning Resources Awareness among Teachers in Northeastern Nigeria

Ibrahim Mohammed*, Balarabe Yushau and Shehu Danladi Zayum

Department of Science Education, Abubakar Tafawa Balewa University Bauchi, Nigeria

*Corresponding Author email: ibmohammedy@gmail.com

Abstract

This study investigates teachers' awareness of e-learning resources in Northeastern Nigeria. Cross Sectional Survey design was used for the study. The population of the study consisted of primary, secondary and tertiary teachers in the Northeastern Nigeria. The respondents of the study consisted of 224 primary school teachers, 454 secondary school teachers and 373 tertiary institutions teachers. A questionnaire with reliability of 0.874 was used for data collection. The questionnaire was earlier validated by three experts. A web -based survey created using Google form was sent to all the six states in the Northeastern Nigeria for elicit responses from the participants. The responses collected were analyzed using the descriptive and inferential statistics. The findings of the study revealed that teachers at all level of education in the Northeastern Nigeria were found to be partially aware of the e-learning resources. A significant difference between primary, secondary and tertiary teachers was found on their e-learning resources awareness. A Post Hoc test showed that the differences were between primary and tertiary teachers and secondary and tertiary teachers with tertiary teachers having more e-learning resources awareness compared to their primary and secondary counterparts. Also, t-test revealed a significant difference between male and female teachers in tertiary institution, with male having more e-learning resources awareness than their female counterparts. Based on the findings, it was recommended that Government should organize training, workshop, symposia and seminars in order to raise the level of e-learning awareness among teachers at all levels of education.

Keywords: E-learning, E-learning Awareness, Teachers, Level of education

Introduction

As technology continues to advance, the spectrum of e-learning continues to expand, embracing innovations such as virtual reality and artificial intelligence, promising even more enriched and personalized educational opportunities. The flexibility, cost-effectiveness, and scalability of e-learning help address issues like limited physical infrastructure, teacher shortages, geographic barriers, and lifelong learning needs (Oriji & Nnadiyeze, 2023; Jayanthi, Priya, Gomathi & Sam, 2023). E-learning has become gradually relevant in recent years as a way for students to gain new skills, knowledge, and access to quality education

(Kuatbekov, Vershitskaya, Kosareva & Ananishnev, 2023). However, the awareness and adoption of e-learning varies significantly between individuals, demographic groups and regions (Žmuk, Hussain Qureshi & Khawaja, 2023).

Digital divide is the differences in access to the ICT resources among demographic groups, such as: individuals, organisations, regions or countries (Payton & Gomez Auriolles, 2021). Digital divide is as a result of several factors among them are: lack of e-learning facilities such as: smartphones, tablets or computers (Valentia, 2023); unreliable electricity supply and limited broadband connectivity

Okocha & Edafewotu, 2022). Other factors that contribute to the digital divide in Nigeria include economic status which is a significant factor of digital divide as individuals with higher incomes often have better access to digital devices and high-speed internet, thereby creating a divide between affluent and lower-income persons (Tsouli, 2023; Ugah, Omoke & Uguru, 2023); cultural attitudes and values influence the adoption and usage of digital technologies. Societies with strong cultural resistance to technology or limited exposure to digital tools may experience digital divides (Tsuria, 2020; Okocha & Edafewotu, 2022). These factors contribute to the digital divide between individuals, organisations and communities.

Digital divide exists among teachers at the same and different levels of education. Some teachers have access to personal computers, laptops, or tablets, while others have limited access or rely on shared resources, unequal access to devices and internet connectivity creates a divide among teachers (Soomro, Kale, Curtis, Akcaoglu & Bernstein, 2020). The quality and availability of technological infrastructure vary among schools of same levels. Teachers in well-funded schools with up-to-date infrastructure have better access to technology resources compared to those in under-resourced schools (Azubuike, Adegboye & Quadri, 2021). Disparities in infrastructure affect teachers' ability to efficiently integrate technology into their teaching practices (Kilag, Miñoza, Comighud, Amontos, Damos & Abendan, 2023). Access to professional development opportunities focused on technology integration also contribute to the digital divide among teachers of same level of education. Some teachers have access to training programs, workshops or support that enhance their digital skills and knowledge. While others have limited opportunities for professional development in this area (Ma, 2021). Additionally,

differences in teachers' digital literacy skills contribute to the digital divide. Some teachers have a higher level of proficiency with technology, allowing them to effectively use digital tools and resources in their instruction, others lack the necessary skills or confidence, which hinders their ability to leverage technology in the classroom (Azubuike et al, 2021; Ekpe, Umoh & Agbeb, 2021).

Digital divide among primary teachers is the most pronounced. Primary schools often have limited resources and infrastructure for technology integration. Access to devices, reliable internet connectivity and digital resources are rare (Sikalima, 2023). Also, primary teachers have fewer opportunities for professional development on technology integration, which further contribute to the digital divide (Hussain, 2020; Abedi, 2023). For secondary school teachers, digital divide among them is less pronounced compared to primary teachers but still exists (Wordu, 2020). Secondary schools have better access to technology resources, such as computer labs and internet connectivity. However, disparities arise based on the availability and quality of resources across different schools. Some secondary teachers have more training and support in using technology effectively, while others have limited access to resources and professional development opportunities (Chisango & Marongwe, 2021). The digital divide among tertiary teachers is often less compared to primary and secondary levels. Higher education institutions typically have better technological infrastructure, including high-speed internet, advanced hardware, and software resources (Soomro et al., 2020). Tertiary teachers have access to learning management systems, online libraries, research database and other digital tools that support their teaching and research activities (Mishra, Gupta & Shree, 2020; Gamji, Kara, Nasidi & Abdul, 2022). However, there still

variations in access to technological tools and resources based on institutional resources, funding, and the specific discipline or department (Alenezi, 2023). E-learning has experienced significant growth. However, there are disparities in its awareness (Ejdys, 2021; Nouraey & Al-Badi, 2023). These disparities exist both on a broader societal level, where some societies are more aware of e-learning than others (Vanitha & Alathur, 2021). In particular, teachers' awareness of e-learning is very critical, because without awareness, teachers cannot successfully implement e-learning in educational programmes. Teachers' e-learning awareness encompasses their understanding of e-learning technologies, personal characteristics and the potential benefits and challenges associated with its use. Teachers' e-learning awareness transforms education by making it more accessible, flexible and appealing (Deepa & Sumathi, 2023; Simhadri & Swamy, 2023; Rajab, Almarabeh, Mohammad & Majdalawi, 2024). Teachers with e-learning awareness expand their technology skills and explore new ways to engage students using digital methods (Alenezi, 2020). Furthermore, e-learning awareness makes teachers to be successful and quickly adapt in the evolving virtual educational environments (Oriji & Nnadioze, 2023). Teachers with e-learning awareness are able to individualize instruction with tools like adaptive learning programs (Falade, 2023). E-learning awareness makes teachers to share resources and creates avenues for them to collaborate remotely and share effective digital lesson plans, activities and materials with colleagues worldwide (Asogwa, Seals, Tripp & Nix, 2023).

In Nigeria, many studies have been conducted on e-learning, students and teachers e-learning awareness at different levels of education. At primary schools, few studies were found to have been

conducted in Nigeria on primary school teacher's levels of e-learning resources awareness. For example, primary school teachers' level of awareness on social media for teaching purpose was found to be below average (Victor, Olatide & Aremu, 2022). However, research on secondary school teachers' e-learning awareness is inconclusive. Some studies found secondary school teachers to be partially aware of the e-learning resources (Bada & Jita, 2021; Toryuha, Mcdaniel & Mbakeren, 2023); while other studies found that secondary school teachers are aware of e-learning tools for teaching and learning (Akanbi, 2020; Muhammad, Adamu, & Abdulkarim, 2021); few studies found secondary school teachers to be not aware of e-learning resources (Ugwu & Ohimekpen, 2015). Similarly, at tertiary level, most studies found teachers to be fully aware of the e-learning resources (Oladeji & Nuhu, 2021; Saidu & Al Manmun, 2022; Palero & Mutya, 2022); few studies have found tertiary teachers to be partially ware of the e-learning resources (Alea et al., 2020; Adigwe et al., 2021; Abdullahi, Makera, Maikeffi & Abubakar, 2021).

Gender is a very crucial in the adoption of e-learning. Understanding differences in e-learning awareness between male and female teachers informs the development of targeted training programmes that address preferences based on gender (Mutambik, Lee & Almuqrin, 2020).

For instance, recognizing and addressing potential gender-related disparities in e-learning awareness contributes to fostering a more inclusive and equitable educational landscape, ensuring that teachers of all genders effectively harness the benefits of e-learning tools in their teaching practices (Žmuk et al., 2023) Some researchers have shown that gender plays a role in determining level of awareness of ICT facilities and e-learning resources among teachers. In general, women are more likely to participate in e-learning,

especially in higher education, suggesting that they are more likely to prefer digital learning platforms. A study found that male teachers had more e-learning awareness than female teachers (Timothy, 2021; Kuliya & Usman, 2021). Many studies reported that male and female teachers have no difference in term of e-learning awareness in the teaching practices (Yushau, Nannim and Gital, 2018; Timothy, 2021; Abdulahi et al., 2021; Kuliya & Usman, 2021; Bawa, 2022; Toryuha, Mcdaniel & Mbakeren, 2023).

Despite all these studies, no study was found to have looked into teachers' e-learning resources awareness at all levels of education in the Nigeria. Also, no study was found to have looked into the level of teachers' awareness of e-learning in the Northeastern Nigeria as a geographical region. It is in view of this, that this study investigates the level of e-learning resources awareness among teachers at all levels of education in the Northeastern Nigeria.

Objective of the Study

The objective of the study is to investigate level of e-learning resources awareness among teachers at primary, secondary and tertiary schools in the Northeastern Nigeria.

Hypotheses

H₀₁: There is no significant difference between primary, secondary and tertiary institution teachers' level of e-learning resources awareness in the Northeastern Nigeria.

H₀₂: there is no significant difference between male and female teachers' level of e-learning resources awareness in

primary, secondary and tertiary schools in the Northeastern Nigeria.

Methodology

Cross Sectional Survey design was used for the study. The cross-sectional survey is the method of choice if a researcher wants to gather the data at one point in time, unlike longitudinal surveys which gather information at different points in time in order to study the changes over extended periods of time. (Ary, Jacobs, Sorensen & Razavieh, 2010; Creswell, 2012). The population of the study consisted of teachers at all levels of education in the Northeastern Nigeria. The respondents of the study consisted of 224 primary school teachers, 454 secondary school teachers and 373 tertiary institutions teachers. A questionnaire titled 'Teachers' Level of E-learning Resources Awareness Questionnaire (TLERAQ)' was used for data collection with the reliability index of 0.874. Three experts validated the questionnaire. The questionnaire consisted of fifteen items, based on a 3- point scale, with Fully Aware (FA) as 3, Partially Aware (PA) as 2, Not Aware (NA) as 1. Real limits were used for the interpretation of responses, where mean score between 1.00-1.49 (Not Aware), 1.50- 2.49 (Partially Aware) and 2.50-3.00 (Fully Aware). A web survey created using Google form was sent to all the six states in the Northeastern Nigeria to elicit responses from the participants. Descriptive and inferential statistics were used to analyze the collected responses. The result of this analysis is presented in tables as shown below

Table 1: Distribution of Study Participants' According to School and States

Categories	Group	No. of Teachers
School	Primary	224
	Secondary	454
	Tertiary	373
	Total	1051
State	Adamawa	172
	Bauchi	206

Borno	144
Gombe	241
Taraba	134
Yobe	154
Total	1051

Source: Web-based Survey, 2023

Results

with the objective of the study and assumptions made.

This section presents the results of data collected and analyzed in the study. The results are presented in the tables in line

Table 2: Mean responses of primary school teachers' responses to the fifteen items of the questionnaire on their e-learning resources awareness

SN	Items	N	Mean	SD	Decision
1.	Existence of e-learning technologies like virtual classrooms and webinar.	224	2.07	0.77	PA
2.	Internet search engines like Google, Yahoo, Bing, Baidu, DuckDuckGO, Altavista.	224	2.59	0.59	FA
3.	Video Conferencing like Zoom, Skype, Google Meet, Microsoft Teams.	224	2.13	0.76	PA
4.	Multimedia Tools like PowerPoint, Prezi, Keynote, Adobe Creative Suite.	224	2.02	0.79	PA
5.	Educational Games and Simulations like Kahoot! Quizlet, Minecraft, SimCity.	224	1.87	0.77	PA
6.	Learning Management Systems like Moodle, Sakai, Schoology, Google classroom, Canvas.	224	2.03	0.75	PA
7.	E-learning platforms such as Coursera, Udemy, edX, and future learn.	224	1.88	0.73	PA
8.	Augmented Reality like Aurasma, AR Flashcards, Quiver.	224	1.85	0.74	PA
9.	Interactive Whiteboards like SMART Board, Promethean Board.	224	1.99	0.73	PA
10.	Collaborative Tools like Google Docs, Microsoft Office 365, Trello, Asa1	224	2.00	0.76	PA
11.	Social Media like Twitter, Facebook, WhatsApp, Telegram, Instagram, TikTok.	224	2.68	0.51	FA
12.	LMS allows teachers to create and administer online classes and assessment.	224	2.04	0.74	PA
13.	LMS allows teachers to integrate multimedia elements like videos, audios and images.	224	2.08	0.75	PA
14.	There is ease of communication between students and teachers through LMS.	224	2.00	0.75	PA
15.	LMSs track and monitor students' progress and performance.	224	2.03	0.74	PA
Grand Mean			2.08	0.73	PA

Source: Web-based Survey, 2023

Out of the 15 items, only item 2 (internet search engines) and 11 (social media platforms) had mean ratings within the range of 2.50-3.00, which means that primary school teachers are fully aware of the two e-learning resources. The remaining items had mean ratings within

the range of 1.50-2.49, which means that primary school teachers are partially aware of these items. The grand mean of the items is 2.08 which fall under the mean rating of Partially Aware. Based on the grand mean, the primary teachers are partially aware of the e-learning resources.

Table 3: Mean responses of secondary school teachers on the fifteen items on their e-learning resources awareness

SN	Items	N	Mean	SD	Decision
1.	Existence of e-learning technologies like virtual classrooms, webinar.	454	2.20	0.75	PA
2.	Internet search engines like Google, Yahoo, Mamma, Altavista.	454	2.62	0.60	FA
3.	Video Conferencing like Zoom, Skype, Google Meet, Microsoft Teams.	454	2.28	0.77	PA
4.	Multimedia Tools like PowerPoint, Prezi, Keynote, Adobe Creative Suite.	454	2.10	0.73	PA
5.	Educational Games and Simulations like Kahoot! Quizlet, Minecraft, SimCity.	454	1.88	0.72	PA
6.	Learning Management Systems like Moodle, Sakai, Schoology, Google classroom, Canvas.	454	2.16	0.76	PA
7.	E-learning platforms such as Coursera, Udemy, edX, and future learn.	454	1.95	0.75	PA
8.	Augmented Reality like Aurasma, AR Flashcards, Quiver.	454	1.81	0.76	PA
9.	Interactive Whiteboards like SMART Board, Promethean Board.	454	2.06	0.73	PA
10.	Collaborative Tools like Google Docs, Microsoft Office 365, Trello, Asa1	454	2.13	0.75	PA
11.	Social media like Twitter, Facebook, WhatsApp, Telegram, Instagram, TikTok.	454	2.74	0.50	FA
12.	LMS allows teachers to create and administer online classes and assessment.	454	2.13	0.73	PA
13.	LMS allows teachers to integrate multimedia elements like videos, audios and images.	454	2.10	0.75	PA
14.	There is ease of communication between students and teachers through LMS.	454	2.13	0.76	PA
15.	LMSs track and monitor students' progress and performance.	454	2.13	0.72	PA
Grand Mean			2.16	0.72	PA

Source: Web-based Survey, 2023

From the 15 items presented, secondary school teachers happened to be fully aware of the item 2, these are (internet search engines) and 11 (social media platforms) whose mean ratings fall within the range of 2.50-3.00. As for the remaining items, secondary school teachers are partially

aware them and their mean ratings is within the range of 1.50-2.49. The grand mean of the responses is 2.16 which indicate that secondary school teachers are partially aware of the e-learning resources.

Table 4: Mean responses of tertiary teachers on their e-learning resources awareness.

SN	Items	N	Mean	SD	Decision
1.	Existence of e-learning technologies like virtual classrooms, webinar.	373	2.42	0.70	PA
2.	Internet search engines like Google, Yahoo, Mamma, Altavista.	373	2.68	0.58	FA
3.	Video Conferencing like Zoom, Skype, Google Meet, Microsoft Teams.	373	2.51	0.72	FA
4.	Multimedia Tools like PowerPoint, Prezi, Keynote, Adobe Creative Suite.	373	2.35	0.73	PA

5.	Educational Games and Simulations like Kahoot! Quizlet, Minecraft, SimCity.	373	1.89	0.72	PA
6.	Learning Management Systems like Moodle, Sakai, Schoology, Google classroom, Canvas.	373	2.38	0.72	PA
7.	E-learning platforms such as Coursera, Udemy, edX, and future learn.	373	2.01	0.72	PA
8.	Augmented Reality like Aurasma, AR Flashcards, Quiver.	373	1.77	0.71	PA
9.	Interactive Whiteboards like SMART Board, Promethean Board.	373	2.25	0.76	PA
10.	Collaborative Tools like Google Docs, Microsoft Office 365, Trello, Asa1	373	2.33	0.78	PA
11.	Social Media like Twitter, Facebook, WhatsApp, Telegram, Instagram, TikTok.	373	2.82	0.42	FA
12.	LMS allows teachers to create and administer online classes and assessment.	373	2.32	0.74	PA
13.	LMS allows teachers to integrate multimedia elements like videos, audios and images.	373	2.36	0.72	PA
14.	There is ease of communication between students and teachers through LMS.	373	2.37	0.72	PA
15.	LMSs track and monitor students' progress and performance.	373	2.27	0.74	PA
Grand Mean			2.32	0.70	PA

Source: Web-based Survey, 2023

In the fifteen items presented, item 2 (internet search engine), 3 (video conferencing apps) and 11 (social media platforms) had their mean ratings within the range of 2.50 - 3.00, this shows that tertiary institutions' teachers are fully aware of these 3 items. The remaining 12 items had their mean ratings within the range of 1.50-2.49. So, tertiary institutions teachers are partially aware of these items.

The grand mean of the all items is 2.32 which fall within the range of 1.50-2.49. Hence, tertiary institution teachers are also partially of the e-learning resources.

To determine whether a significant difference exists between the mean ratings of primary, secondary and tertiary teachers on their level of e-learning resources awareness, one way ANOVA was used

Table 5: Result of ANOVA Comparing the Mean Rating of Primary, Secondary and Tertiary Teachers' Level of e-learning Resources Awareness in the Northeastern Nigeria

	Sum of Squares	Df	Mean Square	F	p-value
Between Groups	8.776	2	4.388	24.25	0.000
Within Group	189.624	1048	.181		
Total	198.400	1050			

Table 5 shows that there is statistically significant difference between the primary, secondary, and tertiary teachers on their level of e-learning resources awareness

with value $p = 0.000$. To ascertain where the differences lie, post hoc test was conducted. Table 6, shows the results.

Table 6: Post Hoc Tests

(I) School	(J) School	Mean Difference (I-J)	P
Primary	Secondary	-.077	.067
	Tertiary	-.233*	.000

Secondary	Primary	.077	.067
	Tertiary	-.155*	.000
Tertiary	Primary	.233*	.000
	Secondary	.155*	.000

Table 6 shows that differences are between primary and tertiary teachers and secondary and tertiary teachers with tertiary teachers having more e-learning resources awareness compared to their primary and secondary counterparts with $p = 0.000$. However, no statistically

significant difference was found between primary and secondary teachers with $p = 0.67$.

To test for difference between male and female teachers in primary, secondary and tertiary teachers, a t-test was conducted.

Table 7: Male and Female Primary School Teachers' Level of E-Learning Resources Awareness

Respondents	N	Mean	SD	t	Df	p-value
Male teachers	123	2.07	.462	-.496	222	0.620
Female teachers	101	2.10	.407			

The result from Table 7 shows that there is no significant difference between male and female teachers of primary school

teachers' e-learning resources awareness with $p = 0.620$

Table 8: Male and Female Secondary School Teachers' Level of E-Learning Resources Awareness

Respondents	N	Mean	SD	t	Df	p-value
Male teachers	305	2.17	.425	.961	452	0.337
Female teachers	149	2.13	.412			

Result from table 8 shows that is no significant difference between male and female teachers of primary school

teachers' e-learning resources awareness with $p = 0.337$

Table 9: Male and Female Tertiary Institutions Teachers' Level of E-Learning Resources Awareness

Respondents	N	Mean	SD	t	Df	p-value
Male teachers	245	2.35	.441	2.374	371	.018
Female teachers	128	2.24	.379			

The result from table 9 reveals that there is significant difference between male and female teachers' e-learning resources awareness of tertiary institution with $p = 0.018$.

It can be noticed from table 2 that the only e-learning resources that the primary school teachers in the Northeastern Nigeria are fully aware of are internet search engine and social media platforms. This is not surprising, because search engines and social media platforms are being used even

Discussion

by a people living outside of academic. The primary school teachers are found to be partially aware of many emerging technologies such as Augmented Reality, Educational Games and Simulations, etc. This is also not a surprising as it was reported by Hussain (2020) that primary school teachers have few opportunities for professional development on technology integration and this is where these resources are introduced. Also, Victor, Olatide and Aremu (2022) reported that primary school teachers' level of awareness on social media teaching purpose is below average.

At the secondary school level, the teachers are not different from their primary school counterparts. They are also fully aware of only internet search engine and social media platforms and partially aware of the remaining e-learning resources. Nonetheless, secondary school teachers have slightly higher mean rating with regard to the awareness on interactive whiteboard and collaborative tools like Google docs and Microsoft 365, etc than primary school teachers. The expectation here is that secondary school teachers should be more aware of some of the sophisticated emerging technologies. This result agrees with the result of (Ugwu & Ohimekpen, 2015; Mbonu-Adigwe, et al., 2021) who found that a number of secondary school teachers were partially aware of e-learning resources. However, it contradicts the results of (Bada & Jita, 2021; Abdulkarim, Nsofor, Tukura & Falode, 2022) who reported that secondary physics teachers were fully aware of most the e-learning for teaching purpose.

For the tertiary institution teachers in the Northeastern Nigeria, the result shows that they are fully aware of internet search engines, video conferencing apps and social media platforms. It is not surprising that tertiary institution teachers are fully aware of more e-learning resources than their primary and secondary school

counterparts. This is because tertiary teachers often have access to advanced hardware, software, and online platforms (Gamji, Kara, Nasidi & Abdul, 2022). However, it is surprising that tertiary institution teachers are partially aware of LMSs, multimedia tool and collaborative tools, these tools are available in tertiary institutions and being used for instructional delivery (Bawa, 2020). This result corroborates with the findings of (Abdullahi et al., 2021, Mbonu-Adigwe et al., 2021) who reported that tertiary institution teachers were partially aware of the e-learning, but contradicts the results (Saidu & Al Manmun, 2022; Palero & Mutya, 2022) who reported that tertiary teachers are fully aware of the e-learning resources.

From Table 6, it is seen that there is a difference between teachers' e-learning resources awareness at different level of education; and the difference is significant between primary and tertiary teachers, and secondary and tertiary teachers. The difference between primary and secondary teachers is not significant. It should be noted that the mean ratings are in ascending order with primary (2.08); secondary (2.16) and tertiary (2.32) in table 2, 3 and 4. This is not surprising as the tertiary school teachers are more exposed and have access to these resources (Titilope, 2020; Gamji, Kara, Nasidi & Abdul, 2022).

Based on gender, a significant difference between male and female teachers' e-learning resources awareness was found in tertiary institution, with male having more e-learning resources awareness than their female counterparts. This is consistent with the literature (Timothy, 2021; Kuliya & Usman, 2021). However, no significant difference was found between male and female teachers of primary and secondary schools. This is not in line with findings of (Yusha'u, Nannim & Gital, 2018; Muhammad, et al., 2021; Abdulahi et al.,

2021; Toryuha, Mcdaniel & Mbakeren, 2023).

Conclusion and Educational Implications of the Study

This study informs educational policy makers the low level of e-learning awareness of teachers at all levels of education in the Northeastern Nigeria. As the world is going towards the use of technology, teachers' e-learning awareness is very critical, because it is a necessary factor for integration and implementation of e-learning resources at all levels of education. Therefore, there is need for policy makers to develop a policy that will enhance the teachers' awareness of e-learning at all levels of educations. In practice, Government should organise workshop and trainings in order to raise the level of e-learning resources awareness of teachers at all levels of education. Also, professional development programmes on e-learning should be provided, peer collaboration and mentoring on the benefits of e-learning, incorporate e-learning in curriculum and provision of online resource centers. Also, female teachers, especially at tertiary institutions should be encouraged to participate in the training to reduce gender disparity.

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