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RESEARCH PAPER

Assessing the Digital Information Literacy Levels among Students in Higher Education

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ABSTRACT

The impact of digital information literacy on students is a critical area of study in today's technology-driven educational landscape. This research explores how digital literacy influences student learning, research capabilities, and overall academic performance. By assessing students' proficiency in utilizing digital tools, hardware, software, and the internet, the study aims to identify the benefits and challenges associated with digital information literacy.Quantitative data is collected through a multi-stage stratified sampling technique, using standardized scales to evaluate students' digital literacy levels. The data is analyzed using Three-Way ANOVA and correlation to uncover significant patterns and relationships. The findings of this research are valuable for enhancing digital literacy education, thereby improving students' academic success and research skills. By understanding the current state of digital information literacy and the obstacles to its adoption, educational institutions can develop more effective strategies and curricula. This study not only highlights the importance of digital literacy in the modern academic environment but also offers recommendations for facilitating its widespread adoption among students, ensuring they are well-equipped for the demands of the digital age.

Keywords: Digital Literacy, Digital Information Literacy, Punjab, Students

Introduction

Change is a natural occurrence (Elliott & Manly, 1987), but there is a variation in how individuals accept change. Every individual develop interactions, attitudes and learning strategies that are both unique in this society (Alamelu et al., 2018). There is a great need of introduction and application of new technologies in educational system globally. Students born after 1990 are known as Digital users, and they know how to use digital technologies in an appropriate way, but still some abilities are required in using these technological skills in educational system (Prensky, 2009). Students of present generation as “digitally literate” remained linked socially on daily basis. (Dreyfus et al., 2018) research implies the need for higher education institutions to be prepared for the adoption of digital technology to understand digital literacy. Implementation of digital information literacy enhances students learning and emphasize on collaborative learning (Belshaw, 2011). Digital literacy growth is a key factor in advance technology that leads to digital literacy competence and self-efficacy of learners. Self-efficacy in learners reflects confidence and the ability to control over one's own motivation, behavior, and social environment (Amri & Alasmari, 2021).

Information consumers in emerging knowledge societies need lifelong learning to grow in all areas. Libraries must teach people how to search, evaluate, and use ethically available information due to the exponential expansion of Internet information. Information literacy classes at libraries worldwide address this issue (IL). “The ability to recognise, locate, assess, organise, and effectively create, use, and transmit information to address an issue or problem” in IL. Pakistani academics, practitioners, and researchers are interested

in IL. Education, research, and IL practises have advanced. Twelve governmental and private universities provide LIS study. Seven provide LIS MPhil or PhD programmes with coursework and dissertations(Anjum, 2020).

It is true that academic technology enhance teaching and learning practices (Higgins, 2003), and create learning environment (Campbell, 2011). Many researchers consider technology for making presentation, making lectures more attractive. Hence, it becomes an integral part of both the teaching and learning process (Adam-Turner & Burnett, 2018) Thus, academic technology help learners to develop their cognitive, sociability, and communication skills (Chigona & Chigona, 2010). Beside classroom discussion most of the students can access wide range of resources and information, and allow students to communicate with professionals (Muzaffar, et. al., 2020; Alamelu et al., 2018). Higher education faces a Digital literacy imperative, where advantages and disadvantages are found with emerging digital technology, demanding new literacy (Adam-Turner, 2017). There are different problems among the various types of institutions that exacerbate what faculty members say as negative variables (Harley, 2008). Unprecedented increase in the use of technologies was witnessed by higher education institutions in the 1990s. Later, emphasized that cognitive science incorporates cognition, intellect, calculation, logic, and eventually knowledge, articulating as science and technology linguistics disciplines: psychology, philosophy, anthropology and computer. The innovation of intellectual computing has therefore evolved into models of thinking and human relationships with computing (Li et al., 2020).

Literature Review

When technology was brought to academic and digital literacy learning programs, neither policy makers, nor academic departments and faculty members were prepared (Muzaffar, et. al., 2019; Nalini et al., 2018). They further state that with the advent of the new millennium that data literacies are unclear due to assumptions of the paradigm of information process. In cognitive and non-cognitive behavior related to the interaction between information and understanding, and the consideration of experiences with human computers, misconceptions occur. Explanation of the misconception indicated that humans think heuristically, participate in numerous, nuanced intellectual for naturalistic decision-making, and make decisions using preferences. Cambria and Hussain (2015) claim that computers cannot think in the same way as human mind thinks; the mechanism is a logical procedure, comprised of a series of unambiguous rules that follow a linear analog path, engaging in vast quantities of metadata and processing speed. Data literacy requires DL, which in turn is universal in shaping the outcomes of faculty pedagogy and student learning. Kanguha (2016)suggests a reorientation towards digital technological fluency, suggesting the inclusion as part of the digital technology ecosystem of multiple information literacies. Hodges et al., (2014) accept that the knowledge search process and information retrieval problems are recognized as an area of anxiety. Various studies indicate a better picture and understanding of the transition from the conventional notion of literacy to the modern, full-digital presentation of information and multimedia technology in the context of reading, writing, and understanding of printed matter. We learn about the complexity of DL and the difficulties faced by institutions, faculty, and librarians after reviewing academic work on these digital literacy characteristics.

It is a concept of new technology, and an important aspect of information literacy. DL is also now popular and all following literacy are part of the entire community of literacy subjects. One has its meaning and importance, also combining to complement each other. Each subject is independent as well, but both have a common denominator. Consequently, it is the central way of the fundamental six root skills, DL, and hence IL as a branch, derives from literacy. According to Stover et al., (2015), DL is an all-encompassing literacy involved in the implementation of AT, and Khalid et al., (2018) describes characteristics that characterize DL, the top four of which are: (1) non-sequential and complex content reading

and comprehension, (2) retrieval skills, plus analytical thinking with informed decisions on retrieved knowledge (Ala-Mutka, 2011). Turuthi (2018) reiterates that there is a mixture of cognitive and non-cognitive factors that affect the potential and performance of a person's digital literacy, and these factors communicate and influence each other in any variety of

The term "self-efficacy" is used to describe a person's confidence in his or her ability to do a certain activity (Bandura, 2012; Cassidy & Eachus, 2002). Although naturally gifted individuals have a leg up on the competition, self-assurance in one's ability to put those abilities to good use is what truly separates them from the pack (Bandura, 1978). The development of one's confidence in one's ability to perform a task successfully is just as important as acquiring the skill set necessary for that performance. However, if they want to succeed in the real world, students need to do more than merely learn IL skills. Kurbanoglu intended ILSE to function as a broad framework (2003). From its inception at the turn of the millennium, studies on IL self-efficacy have gained traction (Kurbanoglu, 2003).

Theoretical framework

Cognitive aspects of digital literacy are essential skills which are needed to search, assess and use the information and resources from the web (McCrory etal., 2000). The skills involve being able to critically evaluate contents of web pages in terms of accuracy, currency, reliability and level of difficulty. Apart from critical thinking skills, the digitally literate person has knowledge of the ethical, moral and copyright issues associated with using web-based materials. Based on the scientific works of Luke (2018), a modern Russian psychologist claims that changes occurs in a mental process of a child, it depends his long-term interaction with computer from birth to teen age. These students have a strong cognitive constructions if in college teacher starts teaching any subject through books it will slow down the learning process of these students, because today's college students wants to get information through modern technology. They have some unique features while using digital technologies e.g., mind mapping, relates one aspect to the other in thinking process, virtually perform various tasks by observing others actions (Prensky, 2009).

Material and Methods

Research designs are carried out to enable the investigator to answer research questions such as validity and objectivity as precisely and economically as possible (Schinstock et al., 2020). Implementation of a design consists of engaging a number of activities systematically. The research followed the Concurrent Triangulation design: Convergence *model. In this design* qualitative and quantitative data have equal waiting or collected and analyzed currently, and result from both are compared, constructed and merge for interpretation (Zhang & Creswell, 2013).

The population is defined as the entire group of people or things that have some general attributes defined by the sampling criteria established by the investigator on which the study findings are generalized. This is a mixed-method study. The population all Govt. colleges (offering B.S Education program) and universities of the Punjab recognized by higher Education Commission. The population for the Quantitative section of the present study will be all Govt. colleges (offering B.S Education program) and universities of Punjab. The population for the qualitative section of the present study will be all the teachers of Govt. colleges and universities of Punjab. It becomes impracticable for the researcher to assess the entire population. Therefore, a small proportion of population is drawn using appropriate sampling method, which is the representative of the whole population, is called sample. For the Quantitative part of the present study, following procedure adopted. Three divisions randomly selected from the Nine Divisions of the Punjab. All public universities and colleges of the three selected divisions as targeted population. Multi stage stratified sampling technique employed to select the sample of 336 students at BS level. Total number

of post graduate colleges are 65 in Punjab division. Most of them colleges are offering BS education program. That's why the sample of the study comprised only on male and female students. Purposive sampling applied for qualitative part of the study for selection of 18 teachers teaching at BS level.

Results and Discussion

Table 1
Perception of new digital technology

			Respondent Gender		Total
			Male	Female	
how do you find out about new digital technology	teachers	Count	1	1	2
		% within how do you find out about new digital technology	50.0%	50.0%	100.0%
		% within Respondent Gender	5.0%	1.4%	2.2%
		% of Total	1.1%	1.1%	2.2%
	family	Count	4	4	8
		% within how do you find out about new digital technology	50.0%	50.0%	100.0%
		% within Respondent Gender	20.0%	5.7%	8.9%
		% of Total	4.4%	4.4%	8.9%
	magazine	Count	8	24	32
		% within how do you find out about new digital technology	25.0%	75.0%	100.0%
		% within Respondent Gender	40.0%	34.3%	35.6%
		% of Total	8.9%	26.7%	35.6%
	TV	Count	6	25	31
		% within how do you find out about new digital technology	19.4%	80.6%	100.0%
		% within Respondent Gender	30.0%	35.7%	34.4%
		% of Total	6.7%	27.8%	34.4%
	website	Count	1	16	17
		% within how do you find out about new digital technology	5.9%	94.1%	100.0%
		% within Respondent Gender	5.0%	22.9%	18.9%
		% of Total	1.1%	17.8%	18.9%
Total		Count	20	70	90
		% within how do you find out about new digital technology	22.2%	77.8%	100.0%
		% within Respondent Gender	100.0%	100.0%	100.0%
		% of Total	22.2%	77.8%	100.0%

The table 1 shows the number of men and women who learned about emerging digital technologies from various sources, broken down by category.

Here is a summary of the data:

Teachers: There were two respondents: 1 male and one female. Fifty percent of males and females say they learn about new digital technology through the same channels.

5.0% of respondents were male, and 1.4% were female; overall, the "Respondent Gender" percentage was 2.6%. The combined percentage of male and female replies is 1.1%. Family: Eight people, four men, and four women, filled out the survey. Fifty percent of men and women say they learn about new digital technology through the same channels. Data for "Respondent Gender" show a percentage breakdown of 20.0% for male and 5.7% for female respondents. The combined percentage of male and female respondents is 4.4%.

Magazine: There were 32 participants (8 men and 24 women). 25.0% of men and 75.0% of women answered "through friends" when asked how they learned about new digital technology. Results broken down by "Respondent Gender" show that men make up 40.0% of the group, while women make up only 34.3%. Male respondents comprised 8.9% of the total, while female respondents comprised 26.7%.

TV: There were 31 participants (6 men and 25 women). For the question, "How do you find out about new digital technology?" the percentages for men are 19.4%, and women are 80.6%. Men comprise 30.0% of the total "Respondent Gender" percentage, while women comprise 35.7%. Men comprised 6.7% of the total, while women comprised 27.8%.

Website: 17 people filled out the survey; 17 were females, and one was male.

Men's responses to "How do you learn about new digital technology?" were 5.9% lower than women's (94.1%).

Respondents (5.0% male, 22.9% female): Percentages inside "Respondent Gender" Overall, 1.1% of men participated, while 18.2% of women did so as a percentage of the population.

This crosstabulation shows how respondents of each gender prefer to learn about and use emerging digital technologies.

Table 2

Improvement in academic and professional talents

	N	Minimum	Maximum	Mean	Std. Deviation
Respondent Institution	336	1	2	1.53	.500
Word processor	336	1	6	4.39	1.482
Email	336	2	6	4.85	1.199
World Wide Web	336	1	6	4.55	1.594
Graphics software	336	1	6	3.54	1.788
Database	336	1	6	3.42	1.626
Spreadsheet (for data organization)	336	1	6	3.82	1.629
Concordancer (for text analysis)	336	1	6	3.10	1.747
Teaching learning software (CD-ROM, DVD)	336	1	6	3.53	1.861
Teaching learning website	336	1	6	3.74	1.755
Teaching learning mobile app	336	1	6	4.17	1.706

Blog	336	1	6	2.72	1.881
Wiki	336	1	6	4.01	1.877
Text chatting	336	1	6	5.35	1.222
Voice chatting	336	1	6	5.26	1.251
Video conferencing	336	1	6	4.87	1.404
Computer game	336	1	6	4.96	1.332
Electronic dictionary	336	1	6	4.44	1.592
Valid N (listwise)	336				

Table 2 provides an overview of the many ways in which the respondents make use of a variety of technology to improve their academic and professional talents. The respondents at these educational institutions have a significant amount of authority when it comes to the inclusion of technology into the educational process, as shown by the statistics in the table that follows. One piece of software that processes words, for instance, has a St. Dv score of 1.482, which suggests that its use is analogous to that of manual work. This is because word processing software is utilized in the process of producing documents. In addition, the percentages of respondents who indicated that they use teaching learning software are as follows: 1.194, 1.594, 1.629, and 1.788 respectively for teaching learning software; 1.194, 1.594, and 1.788 respectively for internet; 1.788 for graphics software; 1626 for databases; and 1.629 for spreadsheets. (1.861),

Table 3
Level of Frequency

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	57.645[a]	84	.686	6.626	.000
Intercept	10.713	1	10.713	103.445	.000
Q42	.288	5	.058	.556	.734
Q43	1.460	4	.365	3.525	.008
Q44	1.832	5	.366	3.539	.004
Q45	1.373	5	.275	2.651	.023
Q46	1.253	5	.251	2.420	.036
Q47	4.268	5	.854	8.242	.000
Q48	4.058	5	.812	7.837	.000
Q49	5.223	5	1.045	10.087	.000
Q50	1.591	5	.318	3.072	.010
Q51	3.873	5	.775	7.479	.000
Q52	2.568	5	.514	4.958	.000
Q53	3.672	5	.734	7.091	.000
Q54	.981	5	.196	1.894	.096
Q55	1.427	5	.285	2.757	.019
Q56	.216	5	.043	.418	.836
Q57	.186	5	.037	.360	.876
Q58	.763	5	.153	1.474	.199
Error	25.995	251	.104		
Total	873.000	336			
Corrected Total	**83.640**	**335**			

Table 3 displays with which respondents use each of the following technologies: 'Very Often,' 'Frequently,' 'Occasionally,' 'Rarely,' 'Very Rarely,' or 'Never,' depending on where it is placed in the table: 'Never,' 'Occasionally,' 'Rarely,' or 'Occasionally.' Table 2 also displays the level of frequency with which respondents use the following technologies: 'Occasionally,' There is a positive correlation between the respondents and the technology if the correlation value, also known as the F-value, is 6.626. Since this value is lower than the type III, it suggests that there is a correlation. In addition, it is reasonable to infer that the people who responded to the survey had some prior experience with the topic that was being discussed. In addition, the value of the margin of error that is mentioned in the questions 42 through 58 is 25.995, whereas the margin of error itself is.104.

Table 4
Use of a Variety of Technology

		Sum of Squares	df	Mean Square	F	Sig.
Word processor	Between Groups	13.993	1	13.993	6.474	.011
	Within Groups	721.932	334	2.161		
	Total	735.926	335			
Email	Between Groups	.115	1	.115	.080	.778
	Within Groups	481.739	334	1.442		
	Total	481.854	335			
World Wide Web	Between Groups	61.219	1	61.219	25.885	.000
	Within Groups	789.921	334	2.365		
	Total	851.140	335			
Graphics software	Between Groups	5.522	1	5.522	1.730	.189
	Within Groups	1065.808	334	3.191		
	Total	1071.330	335			
Database	Between Groups	2.227	1	2.227	.842	.360
	Within Groups	883.761	334	2.646		
	Total	885.988	335			
Spreadsheet (for data organization)	Between Groups	.049	1	.049	.019	.892
	Within Groups	888.510	334	2.660		
	Total	888.560	335			
Concordancer (for text analysis)	Between Groups	.594	1	.594	.194	.660
	Within Groups	1022.359	334	3.061		
	Total	1022.952	335			
Teaching learning software (CD-ROM, DVD)	Between Groups	2.246	1	2.246	.648	.421
	Within Groups	1157.513	334	3.466		
	Total	1159.759	335			
Teaching learning website	Between Groups	81.205	1	81.205	28.544	.000
	Within Groups	950.220	334	2.845		
	Total	1031.426	335			
Teaching learning mobile app	Between Groups	45.418	1	45.418	16.313	.000
	Within Groups	929.913	334	2.784		
	Total	975.330	335			
Blog	Between Groups	3.237	1	3.237	.915	.340
	Within Groups	1182.021	334	3.539		
	Total	1185.259	335			
Wiki	Between Groups	50.412	1	50.412	14.906	.000
	Within Groups	1129.576	334	3.382		
	Total	1179.988	335			
Text chatting	Between Groups	1.012	1	1.012	.678	.411
	Within Groups	498.940	334	1.494		
	Total	499.952	335			
Voice chatting	Between Groups	.000	1	.000	.000	.987
	Within Groups	523.988	334	1.569		
	Total	523.988	335			
Video conferencing	Between Groups	.852	1	.852	.431	.512
	Within Groups	659.386	334	1.974		
	Total	660.238	335			
Computer game	Between Groups	2.044	1	2.044	1.152	.284
	Within Groups	592.453	334	1.774		
	Total	594.497	335			
Electronic dictionary	Between Groups	.222	1	.222	.088	.768
	Within Groups	848.465	334	2.540		

	Total	848.688	335

The table 4 an overview of the many ways in which the respondents make use of a variety of technology to improve their academic and professional talents. The respondents at these educational institutions have a significant amount of authority when it comes to the inclusion of technology into the educational process, as shown by the statistics in the table that follows. Word processor (F-value 6.474 and P-Value 0.011), Email (F-value 0.080 and P-Value .778), World Wide Web (F-value 25.885 and P-Value 0.000), Graphics software (F-value 1.730 and P-Value .189), Database (F-value 0.842 and P-Value 0.360), Spreadsheet (for data organization) (F-value 0.019 and P-Value 0.892), Concordancer (for text analysis) (F-value 0.194 and P-Value 0.660), Teaching learning software (CD-ROM, DVD) (F-value 0.648 and P-Value 0.421), Teaching learning website (F-value 28.544 and P-Value 0.000), Teaching learning mobile app (F-value 16.313 and P-Value 0.000), Blog (F-value 0.915 and P-Value 0.340), Wiki (F-value 14.906 and P-Value 0.000), Text chatting (F-value 0.678 and P-Value 0.411), Voice chatting (F-value 0.000 and P-Value 0.987), Video conferencing (F-value 0.431 and P-Value 0.512), Computer game (F-value 1.152 and P-Value 0.284), Electronic dictionary (F-value 0.088 and P-Value 0.768)

Discussion

The various technological resources that respondents have employed to advance their own academic and professional growth. Survey results for a sample of schools, whose respondents held roles with responsibilities for introducing technology into the classroom are presented in Table 1. Educators of the Past (HLLs). According to Carreira and Kagan (2011), HLLs are defined by the following characteristics: (1) they learned English after learning the HL as a child; (2) they were exposed to the HL primarily in the home; (3) they have strong aural and oral skills but weak literacy skills; (4) they have positive HL attitudes and experiences; and (5) they study the HL primarily to connect with speakers in the United States and to better understand their roots. The expertise and insights of HLLs can be used into community-based curricula to achieve HL outcomes. Educators of the Past (HLLs). HLLs are defined by the following characteristics: (1) they learned English after learning the HL as a child; (2) they were exposed to the HL primarily in the home; (3) they have strong aural and oral skills but weak literacy skills; (4) they have positive HL attitudes and experiences; and (5) they study the HL primarily to connect with speakers in the United States and to better understand their roots. With the use of HLLs, a community-based curriculum can more effectively target HL outcomes (Matten & Moon, 2004).

There is a clear distribution of responses throughout the "Never," "occasionally," "rarely," and "extremely seldom" categories in Table 1.2, with "very often" and "often" being the least frequent. How frequently respondents utilize the following technologies: Using a hierarchical linear model (HLM) and multiple regressions, we examine how students' use of web-based learning technology influences their participation and self-reported learning outcomes in both traditional and digital classroom settings. By means of NSSE inquiries. Students are more actively engaged and learn more while using technology. Students from underrepresented groups and those working full-time are given priority for online education (Chen et al., 2010). Using a hierarchical linear model (HLM) and multiple regressions, we examine how students' use of web-based learning technology influences their participation and self-reported learning outcomes in both traditional and digital classroom settings (Chai et al., 2010). By means of NSSE inquiries. Students are more actively engaged and learn more while using technology. We think about how autonomy in learning could influence students from underrepresented groups and those who only attend school part-time. Recently, the importance of language teachers' roles in fostering student autonomy has come into focus. The perspectives of Pakistani English teachers on their BS students' independence and the social and cultural norms they must adhere to are investigated. additional courses available online (Norris et al., 2003).

An overview of how the people who filled out the survey have used technology to help them grow personally and professionally. Survey results for a sample of schools, whose respondents held roles with responsibilities for introducing technology into the classroom, are presented in Table 1. Engaging in conversation on Twitter could aid grassroots PD teachers in transitioning to actionable roles. To gauge Twitter's significance, we polled teachers from kindergarten through high school. Student and household PD use were outnumbered. This piece examines the perspectives of 494 PDs on Twitter. Educators might pick up using the system quickly and easily(Watermeyer et al., 2021). Twitter provided insights on emerging pedagogical practices and tools. Twitter was favored by many users. In our study, Twitter helped the teachers in our sample network with peers from other districts. Worldwide, colleges and universities are closed due to the COVID-19 pandemic. Professors and universities take a hit as a result. In the United Kingdom, 1148 professors and graduate students were polled to get their perspectives. The increasing adoption of online courses and early "entry-level" digital pedagogies is met with numerous "afflictions" and few "affordances" by educators. For many, the transition to working and living online is fraught with disruption. Globalization caused by the internet poses a challenge to local economies, as well as the viability of local businesses, academic job markets, and local recruitment efforts (Carpenter & Krutka, 2015).

The different ways that people use technology to further their education and careers. The table below shows the results of a survey about how technology is used in the classroom that was sent to key decision-makers in the education field. The goal of this research was to have a better understanding of the present market condition. Do you find it straightforward to pick up new information by reading it on a computer screen? Since the 1960s, the public has been expected to have a basic understanding of science. Science education met nine scientific literacy goals (Davies, 2010). This research supports a broad definition of scientific literacy so that individual school districts and teachers can tailor their efforts to their students' needs. College Composition and Communication uses the latest research and best practices from the fields of rhetoric and composition studies to aid college faculty in their efforts to enhance writing instruction and better represent current thinking (Selfe, 1999). English, rhetoric, cultural studies, LGBT studies, gender studies, critical theory, education, technology studies, racial studies, communication, philosophy of language, anthropology, sociology, and others influence technological communication, computers, and composition. tschool Educational technology leadership analyzes school technology leaders, educational reform, and how 21st-century technology is changing schools. Leadership in educational technology is defined in a variety of ways. Modifications in the classroom brought on by technological advancements Educational technology leadership should focus on teaching and learning; however, research is sparse. education, research, and field history(DeBoer, 2000).

Conclusion

The research sought to investigate the phenomenon of rising levels of digital literacy among students preparing to become teachers while they were enrolled in a training program specifically meant to educate teachers. Specifically, the participants in this study were students who were enrolled in a training program specifically meant to educate teachers. To be more explicit, the people who took part in my research were students who were currently enrolled in a professional development course that was designed to educate teachers. The use of digital technologies is becoming increasingly widespread in a variety of facets of day-to-day life (Blum-Ross & Livingstone, 2020), and this includes the education that students receive and the instruction that is provided in classrooms. As the development of digital literacy becomes an increasingly crucial requirement for teaching and learning in the society of today, teacher education programs are becoming aware of the need to respond to this expanding necessity for in-service teachers. This is because the expansion of this necessity is becoming an increasingly crucial requirement.

The development of digital literacy is becoming an increasingly necessary skill in today's technological society, and it is playing an increasingly important role in the educational process (Daniels et al., 2020). If a teacher education program aspires to successfully promote digital literacy in pre-service teachers, it is very necessary for the goals and learning outcomes of the program to incorporate the development of digital literacy. In addition to this, if the program intends to successfully create digital literacy, then this must be the case. It is essential for teachers to have access to materials and assistance for professional development in order to be able to contribute to the growth of digital literacy in their classrooms and foster an appreciation for its significance. This is because teachers are the best people to instill an appreciation for the significance of digital literacy in their students. This is due to the fact that instructors are in a position to assist students in cultivating an awareness of the value of digital literacy. In order for educational programs that prepare teachers to be successful in encouraging more pre-service teachers to develop their digital literacy skills, it is necessary for those programs to be more forthcoming about the manner in which they include digital literacy into the curriculum of their students. This transparency is required in order for those programs to be successful. Also, programs that are intended to train teachers should incorporate opportunities for professional development for the instructors into their curriculum. This is done so that educators can improve the methods by which they teach their students digital literacy in the classroom and serve as a positive role model for their students. It is possible that pre-service teachers will be better able to incorporate digital literacy into their teaching practice in their future classrooms if the cultivation of digital literacy is encouraged and fostered within teacher education programs. These programs should be designed to meet the needs of pre-service teachers. This is due to the fact that pre-service teachers will have had greater experience in the process of building digital literacy. This is something that could very well be the case, particularly in light of the growing importance of being literate on various digital platforms.

Recommendations

1. Introduce mandatory digital literacy courses at the beginning of academic programs.
2. Embed digital literacy components into existing courses across various disciplines.
3. Improve infrastructure to ensure all students have access to necessary digital tools, hardware, and reliable internet connectivity.
4. Establish digital literacy resource centers within colleges and universities for student guidance and support.
5. Conduct regular workshops and training sessions for teachers on digital literacy tools and techniques.
6. Encourage continuous learning and upskilling in digital literacy for educators.
7. Identify and address specific challenges faced by students and teachers in adopting digital literacy.
8. Provide tailored support to overcome barriers such as limited access to technology and lack of training.

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