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RESEARCH PAPER

Status of Digital Literacy among Elementary and Secondary Students in Punjab

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PAPER INFO	ABSTRACT
	In this era, use of technology becomes more important than ever in daily life, therefore, the significance of digital literacy has been enhanced. It is now an essential skill to survive in the 21st century. This study is about the digital literacy skill of elementary and secondary school students. The study was delimited to basic computer skills. The sample of students comprised of 200 students out of which 99 students were female and 101 were male students. To find the status of basic computer skills, students of elementary, and secondary school students (from science and Arts stream) were purposely selected. The data was collected through an online digital literacy tool where focus was to measure basic computer skills. There were 38 items in the tool and 30 minutes were given to the students to solve it. The score was also generated online. It was found that students were having less basic computer skills which may lead to weak digital literacy skills. Most of the students even do not know the basics of computers. One of the reasons of low or poor basic computers skills was the unavailability of computers and laptops in students' homes. It is recommended to make computers compulsory for secondary classes too so that student can handle the computer gadgets and can equip themselves with digital literacy skills.

Introduction

Technology has acquired an integral place in personal, social and professional lives. Digital literacy skills are essential for educators so that students can be equipped with them and they can be a productive citizen of 21st century. Digital literacy is about the knowledge and ability to use a varied range of technology tools for a various purpose. Digital literacy is an essential skill for

students of all age groups, such as elementary, secondary, higher secondary, and higher education. In the digital world, individuals can connect, create, collaborate, and discover new information on an ever-broadening scale. Therefore, students must have digital literacy skills from the start of educational level. The rapid growth of digital devices in the present digital era are considered as essential tools in formal and informal mode of education (Ramadan, Chen & Hudson, 2018; Göksün& Kurt, 2017) which have changed living styles as well as teaching and learning styles and placed as effective learning resources. Besides effectiveness of digital resources, defiance against the use of digital literacy in education at secondary level exists, which must be addressed by stakeholders due to its more demand in society (Prieto, Torres, Gómez & García, 2020). The professional integrity among teachers which includes two way communication approach, methodology and subject command plays and formation of strong bond between teacher and student have essential role towards the teaching profession and on the other hand teachers' improper attitude creates obstacles during the teaching learning process (Javed, Choudhary &Nazak, 2020) which may be enhance through training and re-training in order to meet the challenges of the twenty first century digital society.

Literature Review

In recent decades, information communication technology has influenced society and become an essential ingredient in an individual life. Now we can use digital tools in the teaching learning process due to effective use in order to deliver the knowledge, skills and higher order thinking concept, therefore, the academic activities can be made more informative through the use of information communication technology in the teaching learning process which is considered as a major revolution (Herout, 2017) but at the same time, the technological pedagogical approach for teachers is also essential in this digital era in order to inculcate the conceptual learning (Wen & Shinas, 2021). The flipped approach facilitates online and face to face interaction through technological tools in order to promote technological pedagogical knowledge with application can be utilized for the professional development of teachers (Hall, 2018). In the same context blended learning approach may be utilized to develop online pedagogical skills and intrinsic as well as extrinsic motivation can created among learners towards educational attainment (Javed& Asghar, 2017) through which scientific attitude can be created that facilitates the proper shape of life to survive and to fulfill the needs and demands of the digital era of twenty first century. Students become capable to understand higher order thinking approach towards problem solution through formation of the scientific attitude (Choudhary, Noor &Javed, 2020). But at the same time, many existing digital literacy tools and media need to assess its spectrum of skills and obstacles in order to inculcate at local contexts as per educational need (Bulger, 2012) because media literacy is the capability of assessment, analysis and evaluation of media message and communication to audience in actual form. Batool & Mehmood (2012) have focused the need and challenges of information literacy in Pakistan, struggles have been made at university level but still need to address many challenges at school level because the creation of digital society is the demand of

present era. Proper learning resources and digital infrastructure at secondary level is essential to promote digital literacy among young learners.

Professional development of teachers is directly associated with the teaching learning process in order to promote digital learning skills among learners and at the same time teachers can enhance the teaching skills through digital tools, so training of teachers is essential to enhance the capability (Ashraf, Riaz & Hussain, 2020).

The autonomy of personal digital devices has directly associated with positive attitude and digital learning behavior (Seyal, Rahman & Rahman, 2002) and considers as demographic factors towards the proper use of information communication technology (Motshegwe & Batane, 2015). Likewise, use of tablets, mobile phones and smart phones may create positive attitude towards digital literacy. Equip team (2019) has described that "digital literacy is the ability to understand, use, and interact with technology, media, and digital resources in real-world situations, providing the foundation for college and career readiness in the 21st century". There are specific and interrelated skills that can be helpful to inculcate digital literacy among students. Although, the use of digital tools such as computers, tablets, smart phones is common now a day, however, it necessary does not mean that everyone has the basic computer skills. The situation is much different where students do not have access to any of the digital tools.

Similarly, in most of the schools, digital literacy is not being taught systematically; and students are left with the devices without any guidance and training.

Digital literacy skill is being categorized into four broad themes:

 i.   Basic Computer Skills: it is the basis of digital literacy as it is about the basic knowledge of fundamentals of computers and typing skills.

 ii.   Computer Applications Skills: it is named as mature digital literacy as it is about   usage of computer applications and functions.

 iii. Computational Thinking Skills: these are more broaden form of digital literacy as it requires computational thinking.

 iv.   Digital Citizenship Skills: these are more precise digital literacy skills as it facilitates students to have and manage their "online presence" by understanding responsible technology use.

The teaching of digital literacy begins with the basic computer skills that students require to use technology. Without understanding fundamentals of computer, students cannot proceed further for digital literacy. Students re required to master fundamentals of computer so that they can navigate the digital world. Students must know the basics of computers so that they can understand its

functions, processes and usage. Typing, opening a new file, make a new draft, editing, copy and paste are also computer fundamental skills.

The level of basic computer skills is different at different in different countries. Umar and Jalil (2012) conducted a survey in Malaysia to find the level of ICT skills among secondary school students. The researchers also found the barriers to use ICT. A sample of 160 students (rural and urban) was selected from four schools. The findings showed that the students had moderate levels of ICT skills for basic applications and for Internet applications in accessing and sharing information. The study also showed that the secondary school students had lowest level of advanced ICT applications. However, students had proficient level of Internet applications for communication skills. There was no significant difference between male and female school students in terms of the students' levels of ICT skills. However, significant difference was found in terms of ICT skills between students of urban and rural school. The study also found that there were administrative and facility barriers that impede the use of ICT. The researchers proposed to reduce barriers and obstacles so that integration of ICT can be made possible among students. Pennings (2001) cited Hirschbuhl & Faseyitan (1994) that the researchers proposed to educate students about need and skills of basic computer literacy. It can be made possible through appropriate professional development training of teachers so that they can overcome their fears of using computers and their technological literacy be enhanced. It will also enable instructors to make their learners able to incorporate and use computers for meaningful learning applications (McKenzie, 2000). Therefore, there is need of training for the instructors at all levels of teaching as computing technology is rapidly changing.

Material and Methods

Research design

It was a descriptive research. Quantitative approach was used in it.Survey method was used for this study.

Population

All students of 8th, 9th and 10th grade were the population of this study.

Sample

A sample of 200 students was purposefully selected, out of which 99were female students and 101were male students.

Research Instrument

The data was collected using and online available tool developed by North Star is a program of Literacy Minnesota (available at https://www.digitalliteracyassessment.org/).

There were 38 items in it. The test is being conducted in real time. The score is generated after the test. Students were allowed to solve the online test in 30 minutes. Computer labs were used to collect the data from online tool.

Delimitations

As there are several components of digital literacy. Therefore, this study was delimited to the essential Computer Skills. Within essential computer skills, the study was focused on the basic Computer Skills

Results and Discussion

Table 1
Range of scores (in Percentage)

N	Minimum	Maximum	Range	Mean	Std. Deviation
200	33.2655	68.30	68.30	33.2642	15.13620

Table 1 shows that the mean score of participants was 33.26, whereas the minimum score was 33.26 and maximum score was 68.30%.

Table 2
Detail of sample

Group	Gender	Class			Total
		8th	9th	10th	
Science	Male	-	20	22	42
	Female	-	21	19	40
	Total	-	41	41	82
Arts	Male	20	21	18	59
	Female	20	21	18	59
	Total	40	42	36	118
Total	Male	20	41	40	101
	Female	20	42	37	99
	Total	40	83	77	200

Table 2 shows sample of the study. There were 200 students in the sample out of which 40 students were from 8th grade, 83 students from grade 9th and 77 students from grade 10th.

Table 3
Descriptive Statistics of Gender Wise Basic Computer Skills

Variable	Gender	N	Mean	Std. Deviation	Std. Error Mean
Score	Male	101	35.0149	13.86789	1.37991
	Female	99	31.4808	20.41266	2.05155

Table 3 shows the descriptive statistics of basic computer skills. It shows that the male had mean score of 35.01 % whereas female had mean score of 31.48 regarding basic computer skills.

Table 4
Gender wise difference of scores of basic computer skills

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
Score	Equal variances assumed	21.96	.000	1.435	198	.153	3.534	2.463	-1.323	8.391
	Equal variances not assumed			1.429	172.19	.155	3.534	2.472	-1.346	8.414

Table 4 shows the inferential statistics of score of basic computer skills. It shows no significant difference between male and female students.

Table 5
Descriptive statistics of mean score f basic computer skills of science and arts students

	Group	N	Mean	Std. Deviation	Std. Error Mean
Score	Science	82	41.562	16.944	1.8711
	Arts	118	27.500	15.433	1.4207

Table 5 shows the mean of basic computer skills of science and arts students. It shows that the mean score of science students (M=41.56,SD=16.94) was found more than arts students (M=27.50, SD=15.43).

Table 6
Mean difference of basic computer skills of science and arts students

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
Score	Equal variances assumed	1.673	.197	6.087	198	.000	14.062	2.310	9.5064	18.617
	Equal variances not assumed			5.985	163.6	.000	14.062	2.349	9.423	18.701

Table 6 shows inferential statistics of basic computer skills of science and arts students. It shows that there is significant difference between science and arts students regarding basic computer skills.

Table 7

Mean difference among different groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
8th	40	25.6925	14.17593	2.24141	21.1588	30.2262	.00	47.20
9th	83	30.4506	16.16683	1.77454	26.9205	33.9807	12.00	63.80
10th	77	40.2338	18.03894	2.05573	36.1394	44.3281	10.00	68.30
Total	200	33.2655	17.46361	1.23486	30.8304	35.7006	.00	68.30

Table 7 shows that the mean score of grade 10th students was found more (M=40.23, SD=18.03) than other two groups.

Table 8

ANOVA test

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	6690.545	2	3345.272	12.204	.000
Within Groups	54000.027	197	274.112		
Total	60690.572	199			

Table 8 shows the output of NOVA test applied to find significance of difference among different grades. It shows that there was significant difference ($F_{2=}12.204$, p=0.000). To further investigate the difference among groups, following LSD test was applied.

Table 9

LSD test to find difference among groups

(I) Class	(J) Class	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
8th	9th	-4.75810	3.18675	.137	-11.0426	1.5264
	10th	-14.54127*	3.22687	.000	-20.9049	-8.1776
9th	8th	4.75810	3.18675	.137	-1.5264	11.0426
	10th	-9.78316*	2.61963	.000	-14.9493	-4.6171
10th	8th	14.54127*	3.22687	.000	8.1776	20.9049
	9th	9.78316*	2.61963	.000	4.6171	14.9493

*. The mean difference is significant at the 0.05 level.

Table 9 shows that there is significant difference of basic computer skills between grade 8th and grade 10th and grade 9th and grade 10th.

Discussion

This study was about the status of digital literacy skills among elementary and secondary school students. Most of the students did not have sufficient computer knowledge and skills despite of acknowledging the significance of basic computer skills for interactive and multimedia-enhanced learning. The maximum score of 68% does not provide evidence of better condition about basic computer literacy skills. There is also no significant difference in basic computer literacy silks of boys and girls. However, significant difference was found between science and

arts students. Where science students were found to have more basic computer literacy skills than arts students. It may be due to the reason that science students must have frequent use of computers. Similarly, grade 10th students were found to have more computer skills than 8th grade and 9th grade. It may be due to the reason that with the increase in grade level, utility of computer skills increases. Chase & Laufenberg (2011) proposed that students need to learn basic computer skills for the success in 21st century. Martin and Grudziecki (2015) proposed to develop a suit to gauge the progress of teachers and students about their digital literacy skills. This study also proposes to continuously monitor the basic computer skills of teachers as well as learners so that they can be at par with the other students of the world and be up to date regarding new software, hardware's and technologies and can effectively use these in their teaching and learning.

Recommendations

Students can be benefited from basic introductory computer courses from early school stages. There are numerous computer skills to be learnt, therefore, computer application courses must be offered at all levels of schooling with hands on experiences such as provision of computer labs and their access to the laboratory. Special measures must be taken to provide opportunities to those students who does not have computer systems at home and lack computer skills. It is recommended to take certain measures to educate students about basic computer skills. The basic computer skills can be taught as separate but compulsory course. The basic computer skills can be taught to students, by integrating different skills in different subjects. Teachers can give open ended questions for inquiry to search from internet, in this way they can learn the computer skills. Students can be given assignments such as presentations to present information about assigned topic. As most of the students at government schools do not have computers at home therefore, they must be provided opportunity such as library time to use computers in the computer labs of schools to search material for their assignments/projects.

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