DIGITAL LITERACY AS A CHALLENGE FOR STUDENTS TO ATTEND ONLINE CLASSES DURING COVID-19 PANDEMIC: A CRITICAL ANALYSIS

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The recent revolution in digital technology has changed almost every aspect of our lives: how we communicate, work, enjoy our leisure time, and use the source of knowledge and information. At present, children are comfortable using different digital tools. However, it does not imply that they are digitally literate. The key here is that they still need to be supported and guided to be digitally literate. This will greatly propel their learning. All the more, digital literacy is significant for the first-time user especially due to challenges brought by the pandemic situation. Students' pressing need to attend online classes forced them to be digitally literate, which was neglected earlier. Considering this existing gap, this study aimed to identify students' digital literacy and the challenges faced in online learning. This survey-based study used the data from 100 students of Jawahar Navodaya Vidyalaya (JNV) Jethian, Gaya and D.A.V. Medical Unit, Gaya, India. The study revealed that the students need support and guidance to be digitally literate to enhance their learning experience. In this backdrop, the focus of different educational institutions needs to realign to address these challenges and prepare students equipped with digital competencies.

Keywords: Digital literacy, online classes, digital competencies.

Introduction

The sudden outbreak of Coronavirus Disease-2019 (COVID-19) pandemic has affected 1.26 billion students worldwide (United Nations, 2020). It became challenging for the teachers to teach in a physical setting. The teachers looked for opportunities that could bring the teaching-learning process on track. As a result, teaching-learning activities have surged in virtual tutoring, video conferencing, and online learning platforms. Classes on Google Meet, Zoom App, Google Classroom, WhatsApp, Skype, etc., have become a norm. As per the advancement of recent technology, students worldwide have two challenges: the first is to learn to use the latest technology, and the other is to interact more effectively with one another (Spires et al., 2017).

To go through the online teaching-learning process, internet connection is critically essential. According to a report based on the 2017–18 National Sample Survey, less than 15 per cent of rural and 42 per cent urban Indian households have internet access (Ministry of Statistics & Programme Implementation, 2020). During the COVID-19 pandemic, internet consumption rose dramatically by around 13 per cent in India

(Madhukalya, 2020). Today, 70 per cent of the 15 to 24 years old age population is online (Coward, 2018) and often spend more time online than adults above these age limits (Ofcom, 2019). Therefore, they are more exposed to both benefits and the risks of being connected. Today smartphone is the primary access point for the internet in India. Five hundred million smartphone users were reported at the end of 2019 in India (India Cellular and Electronics Association, 2020). Digital literacy is more important for first-time users to help them become more responsible, employable, and tolerant future citizens (Nascimbeni & Vosloo, 2019). Sudden exposure to digital screens for long hours of attending online classes without prior experience may cause physical and mental stress on students (Gohain, 2020).Children start using digital tools at an early stage. However, this does not mean that they are digitally literate. They still need supporting guidance for developing their critical evaluation skills, information-seeking skills, and collaboratives competencies (Kanchev et al., 2016).

Challenges of Digital Literacy

One of the major challenges that hinder students' digital literacy across the globe is quality of access. Poor-quality technological infrastructure, unavailability of local language content relating to everyday activities disrupts the students' ability to gain digital literacy (Nascimbeni & Vosloo, 2019; Tan et al., 2017). The slow curricular reforms in many countries keep students away from the advantage of being digitally literate (Coward, 2018). Another challenge in enabling the students to be digitally literate

is the awareness and support of parents at home. On the one hand, a study by Livingston & Byrne (2015) indicates the need to make parents aware of the potential opportunities which bring their children digitally literate. On the other hand, a study by Mascheroni et al. (2016) highlights the parental expectations of the role of ICT in their child's future. The parental role is grooming and socialising their children to take advantage of the digital literacy toward their growth and development, which goes a long way to make their children future-ready. The study has also highlighted that teachers who use Information and Communication Technology (ICT) in their teaching and schools which invest in the ICT training of their teachers tend to have better digital competencies in their students (Fau & Moreau, 2018). One of the other challenges is the lack of digital literacy being mainstreamed in the school curriculum (Nascimbeni & Vosloo, 2019).

Understanding Digital Literacy in the Current Scenario

Digital literacy can be seen as an umbrella term that includes several sister concepts such as computer literacy, information literacy, 21st-century skills, media, and information literacy. It extends to using digital devices and digital media production, information processing, retrieval, and social network participation to create and share knowledge (Alexander et al., 2016; Karpati, 2011). However, from a pragmatic point of view, digital literacy is the set of skills, knowledge, and attitudes required to access digital information effectively, efficiently, and ethically including how to evaluate digital data and how to use it (Spante et al., 2018).

According to Law et al. (2018), digital literacy is about creating information not only safely but also appropriate. It also includes access, management, understanding, integration, communication, and evaluation using key competencies in computer literacy, ICT literacy, information literacy and media literacy. Similarly, Nascimbeni and Vosloo (2019) also explains digital literacy as having knowledge, skills and attitudes that safely empower children to grow and flourish in the global competitive digital world. Ministry of Electronics and Information Technology (2020) defined digital literacy as individuals' ability to understand and use the basics (terminology, navigation, and functionality) of digital devices. It extends across the ability to use technologies for meaningful actions like-accessing, creating, managing, and sharing information; using the internet and technology to communicate effectively; frequently using the technology in everyday life and executing cashless transactions through digital financial tools, online citizen-centric services, etc. As per the current scenario, digital literacy in education encloses much more than the above concept. For example, students must have skills like the ability to operate digital platforms to attend online classes, create passwords, follow age-appropriate privacy concerns, create, collaborate, share digital content with peers and their teachers and be respectful and responsible online.

Rationale of the Study

We are growing up in a world where digital technologies are universal and indispensable. It propels innovation in education and training practices, improves access to lifelong learning, imparts new digital competencies (Carretero et al., 2017). Karpati (2011) revealed that digital literacy has positive effects on skills essential for successful learning. It helps the students access information more efficiently, manage data, and use it in their private lives. Abdollahyan and Ahmadi (2011) clearly expressed that students who started using the internet earlier and spent more time on web browsing are more familiar with digital literacy. Pratap and Singh (2018) explored that respondents significantly used digital resources daily to update their subject knowledge and advance their thinking skills. Saubari and Baharuddin (2016) explored that students preferably used digital literacy for knowledge-seeking purposes, which can be applied in real life. Rokenes and Krumsvik (2014) pointed in their study that the development of digital literacy depended on the acceptance of new learning methods, collaborative learning, and connecting theories with practice. Ata and Yildirim (2019), in their study, concluded that digital literacy courses should be included in all teacher education programs. They also emphasized practical activities so that they could navigate the digital environment effectively. Similarly, Milenkova, Manov, and Peicheva (2020) found in their study that education and the technological environment play a crucial role in shaping digital skills. They also emphasised giving more effort to improve the educational methods to create digital competencies for learners. Choudhary (2020) pointed out that besides having various problems and hindrances in attending online classes, lack of digital literacy of students was also a major reason due to which only 30 per cent of the students were able to attend online classes. He also suggested urgent policy interventions to promote and ensure digital literacy among the masses for successful online classes.

The analysis of the above research studies shows that majority of the researches were conducted about digital literacies and their impact. However, only a few studies tried to find digital literacies and the challenges students face in attending online classes. Hence, the proposed study of digital literacy as a challenge for students to participate in online classes during the COVID-19 pandemic is imperative in the current scenario.

Research Questions

1. To what extent is digital literacy possessed by students?

2. What are the different kinds of challenges faced by students to attend online classes?

3. What are the different kinds of digital devices being used by students to attend online classes?

4. What are the different digital platforms being used by students for academic activities?

Objectives of the Study

1. To identify digital literacy possessed by students to participate in online classes.

2. To find out the challenges faced by students while participating in online classes.

3. To find out the kinds of digital devices used by students while attending online classes.

4. To find out the different digital platforms used for academic activities to participate in online classes.

Research Method

Since the present research study intends to focus on digital literacy as a challenge for students to participate in online classes during the COVID-19 pandemic, it studies to understand the impact of a non-manipulative variable. In the situation of the COVID-19 pandemic, the descriptive survey method of research was most appropriate for this study (Creswell and Creswell, 2018).

Population and Sample

In this study, all students of classes VII, VIII, and IX studying in Jawahar Navodaya Vidyalaya Jethian, Gaya and D.A.V. Public School, Gaya, India, constituted the population. More than 1000 students are studying in both schools. A representative random sample of 100 students was selected from both schools. Out of 100 students, 59 were boys, and 41 were girls.

Tools and Techniques

1. DigComp 2.0: The Digital Competence Framework for Citizens developed by Vuorikari et al., 2016 was used as a three-point rating scale as a tool to check digital literacy.

2. The self-developed three-point rating scale was used to find out the challenges students face while attending online classes.

3. A self-developed alternative Yes-No scale was used to determine the frequency of use of digital resources and digital platforms used for academic activities to attend online classes.

Data Collection

The data was collected digitally through google forms. All the questionnaires were set in the google form, and the link was sent to the students of respective classes. They were requested to complete the questionnaire within a limited period. Randomly first 100 responses were taken from both the schools. After receiving 100 responses, the option to receive further data was turned off in the goggle form.

Analysis and Findings

Digital literacy competence areas, along with their description, were studied with a rating scale. Respondents were asked to mark their responses with always/sometimes/never. Table 1 gives the analysis of their responses.

Table 1: Digital literacy competence areas, along with a description

Competence Area	Descriptions	Rating Scale			Results (%)
		Always	Sometimes	Never	
Fundamentals of hardware and software	Able to turn on/off the digital devices.	63	35	2	98
	Able to create a user account and password in the devices.	56	33	11	89
Information and data literacy	Able to browse, search filter data and information.	53	43	04	96
	Able to evaluate, manage data, information, and digital content.	16	24	60	40
Communication and collaboration	Able to choose the right tools for the mode of communication.	43	47	10	90
	Able to share and collaborate through digital technologies with their online instructors or their virtual classmates.	44	43	13	87
Digital content creation	Able to develop digital content (text, graphs, images, and multimedia)	10	17	73	27
	Able to integrate or create new information/content.	09	06	85	15

Safety	Able to protect digital devices.	39	56	05	95
	Able to protect personal data and privacy	54	36	10	90
Problem-solving	Able to solve technical problems	28	56	16	84
	Able to creatively using digital technologies	32	51	17	83

Table 1 and Fig. 1 indicate that in the domain of fundamentals of hardware and software competence area, 98 per cent of the students were competent enough to operate their digital devices. Along with this, most of the respondents (89%) of the students were able to create a user account and set a password on their devices.

In another domain of information and data literacy competence area, the majority of the respondents (96%) were competent in browsing, searching, filtering data and information. Still, a significant number of the respondents (60%) were unable to examine the reliability and validity of the data source, information and digital contents.
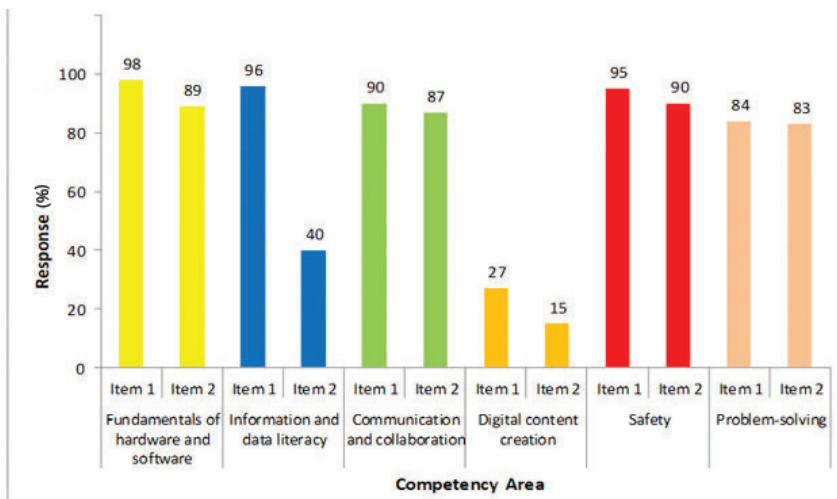

Fig. 1. Graphical presentation of digital literacy competence

In the competence area of communication and collaboration, the majority of the respondents (90%) were competent enough in choosing the right tools for interacting through a variety of digital technologies, and the majority (87%) have the right skills to share and collaborate through digital technologies with their online instructors or their virtual classmates.

In the digital content creation competence area domain, the majority of the respondents (73%) were unable to produce and modify digital content in different formats (text, graphs, images and multimedia). Along with this, most of the respondents (85%) were not competent enough in integrating or creating any content.

In the matter of safety area of competence, the majority of the respondents (95%) were able to protect the digital devices, whereas (80%) students were able to protect their data and privacy.

In the problem-solving subscale of competence area, the majority of the respondents (84%) were able to solve technical problems, and also most of them (83%) had skills and the ability to use digital technology creatively.

Students' challenges to attend online classes were identified with a rating scale that asked them to respond with always/sometimes/never with the statements. Table 2 gives the analysis of their responses.

Table 2: Challenges faced by students while attending online classes

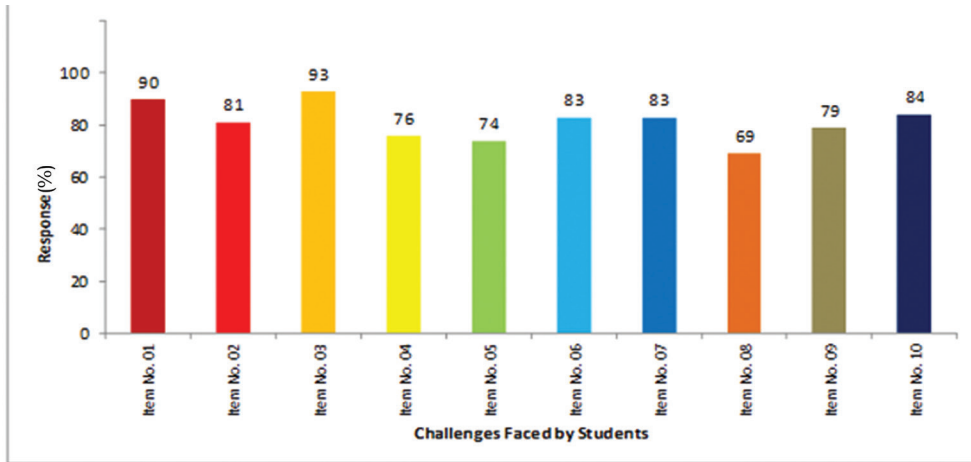| Item No.	Description of Items	Rating Scale			Results (%)
		Always	Sometimes	Never	
1.	Low internet connectivity (especially for remote places, including cost)	42	48	10	90
2.	Lack of ICT infrastructure	40	41	19	81
3.	Problems with audio and video connectivity	41	52	07	93
4	A large number of classes in a day	49	27	24	76
5.	Unavailability of devices like - android phone, laptop, tablet, computers, etc.,	40	34	26	74
6.	Issues with installation and login problems on online platforms	34	49	17	83
7.	Whether the concept is being cleared	27	56	17	83
8.	Lack of quality content in the local language	32	37	31	69
9.	Lack of teachers' technical capacity	36	43	21	79
10.	Too much screen time cause poor vision, strain, anxiety, and physical problems	49	35	16	84

Fig. 2. Graphical presentation of digital literacy competence

As shown in Table 2 and Fig. 2, most of the respondents, 90 per cent, agreed that low internet connectivity (especially for remote places, including cost) and the unavailability of ICT infrastructure were significant challenges faced by them while attending online classes. Another major problem faced by most respondents, 93 per cent, was on issues relative to audio, video connectivity, and 76 per cent had issues with having too many classes in a single day.

To attend online classes, devices like android phones, laptops, tablets, computers, etc., were essential. Seventy-four per cent of the respondents faced problems with the unavailability of these devices. This problem was further compounded by the installation and login issue faced by 83 per cent of respondents.

The majority of the respondents (56%) agreed that the concepts were not being taught clearly. Besides that, the unavailability of quality content in the local language was also a significant challenge in online learning for 69 per cent of the respondents.

Seventy-nine per cent of the respondents agreed that there was a lack of teachers' technical competence. Due to sudden exposure to digital screens for a long hour, 84 per cent of students reported poor vision, strain, anxiety, and physical problems.

Qualitative data collected using open-ended questions were analysed thematically.

Students' responses on challenges to attend the online classes are summaries below based on themes.

Table 3: Theme-wise description of challenges faced by students.

Themes	Description of the themes
Letter-size	Small letters appear on the screen during the online teaching-learning process.
Doubts session	Students rarely get doubt clearing sessions during online classes.

Time management system	Classes were set as per the teachers' choice and ignoring student's convenience.
Practical session	There was no provision of the practical session for the science classes.
Digital Devices	There was always a lack of availability of digital devices at home.

Availability of digital devices used for academic activities has been identified with an alternative scale which asked them to respond with Yes/No. Table 4 maps out their responses.

Table No. 4 indicates that 96 per cent of the students had a smartphone, 45 per cent had a laptop, 12 per cent had a tablet and only 10 per cent had desktop to be used for academic activities.

Data regarding the availability of digital platforms used for academic activities were identified with an alternative scale Yes /No response. Table 5 gives the analysis of their responses.

Table 4: Availability of digital devices to attend online classes

Sl. No.	Digital devices	Yes	No
1.	Smart phone	96	04
2.	Laptop	45	55
3.	Desktop	10	90
4.	Tablet	12	88

Table 5: Digital platforms used during online classes

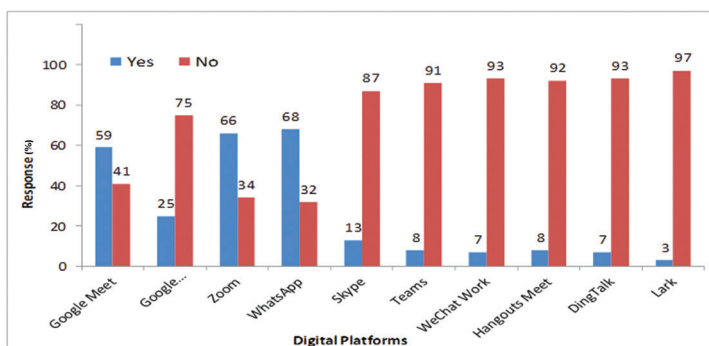| Sl. No.	Digital Platforms	Yes(%)	No (%)
1.	Google Meet	59	41
2.	Google Classroom	25	75
3.	Zoom	66	34
4.	WhatsApp	68	32
5.	Skype	13	87
6.	Teams	08	91
7.	WeChat Work	07	93
8.	Hangouts Meet	08	92
9.	Ding talk	07	93
10.	Lark	03	97

Fig. 3: Graphical presentation of different digital platforms used during online classes

Table 5 and Fig. 3 indicate that different digital platforms were being used for academic activities, where WhatsApp usage was at 68 per cent, Zoom at 66 per cent, Google Meet at 59 per cent, and Google Classroom at 25 per cent. Similarly, other digital platforms like Skype, Teams, We Chat Work, Hangouts, Ding Talk, and Lark were 13 per cent, 8 per cent, 7 per cent, 8 per cent, 7 per cent and 3 per cent, respectively.

From the above discussion, it can be concluded that digital platforms like Google Meet, Zoom, and WhatsApp were frequently used to organise online classes for the teaching-learning process.

Discussion of the Results

In this student-oriented study, it has been established from our results and analysis that the majority of the students had digital literacy in the competence areas like fundamentals of hardware and software, communication and collaboration, safety, problem-solving, but they were less competent in the area of data evaluation and management, information and digital contents. Along with this, most were less competent in digital content creation, which comprised developing digital content (text, graphs, images and multimedia) and integrating and creating new content.

However, attending online learning systems exposed students to many challenges. The main difficulties identified were the unavailability of devices like android phone, laptop, tablet, computers, etc. They also had issues with installation and login problems on online platforms, low internet connectivity interfering with audio and video connectivity. Another fundamental barrier was the lack of teachers' technical competencies because they were trained to a teaching process in a physical setting. The sudden switching of teaching to an online portal gave teachers no time to equip themselves. Online learning required quality content materials that were designed specifically for the virtual learning environment. A huge gap arose between the demand for digital competency from the teachers and their skills level. Besides, sudden exposure to digital screens for long hours with no standard practical practice leads to poor vision, strain, anxiety and physical problems among the students. The findings were inconsistent with the report shared by (Hassinger-Das et al., 2020; Gohain, 2020). It is also found that smartphones were the most critical digital devices used by most students to attend their online classes. This finding of the current study supports and is aligned with the findings of a study conducted by Rajasekhar and Jaishree (2020) that the mobile phone or the smartphone was an essential device used as a necessary education tool. Google Meet, Zoom, WhatsApp have become the digital collaborative platforms used by most of the respondents for learning requirements.

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