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Online Teaching – Another Battle against COVID-19 in Goa

Delia Antão,
Nirmala Institute of Education
Panaji- Goa

Areena Fernandes
Holy Cross High School
Bastora

Author Note
Delia Antão, Officiating Principal, Nirmala Institute of Education, Altinho, Panaji, Goa- India.
E-mail: deliaantao@gmail.com
ORCID identifier: 0000-0003-4316-6927
Areena Fernandes, Assistant Teacher, Holy Cross High School, Bastora, Goa- India.
E-mail: areena2701@gmail.com
ORCID identifier: 0000-0001-6388-6513

Abstract

Education has been one of the seriously affected areas in the wake of the COVID 19 pandemic. The universal paradigm shift from the prevailing dominant traditional pattern of classroom instruction, to the digital mode of teaching, was aimed at maintaining continuity in the learning process of the students. However, training teachers to use the various e-resources and digital platforms for the online mode of teaching within a short period was a massive challenge for the government and the educational institutions. This study tried to find the relationship between the Digital Literacy of teachers, the Training Programme for the Online Mode of Teaching provided by the Department of Education, and the Implementation of the Online Mode of Teaching in Goa. The sample consisted of 532 school teachers from all over Goa, the majority of them teaching Std. V to X. A 5-point Likert Scale questionnaire, standardised using Cronbach's Alpha was administered through Google Forms and the data collected was analysed using descriptive statistics, correlational analysis, and the Pearson Correlation Coefficient using SPSS 26. The analysis shows a weak negative correlation between the Digital Literacy of the school teachers and the Training Programme for online teaching. There is also a weak negative correlation between Digital Literacy and the Implementation of the Online Mode of Teaching. A positive correlation is observed between the Online Training Programme and the Implementation of the Online Mode of Teaching.

Keywords*: Digital literacy, training for online teaching, online mode of teaching, e-resources, digital platforms, professional development programmes.*

Declarations

Funding - Not Applicable.

Conflicts of interest/Competing – Not Applicable

Ethics approval - Ethical approval for the study protocol has been obtained from the Committee for Research Ethics, Nirmala Institute of Education and signed by Dr. Maya Carvalho e Rodrigues, the Co-ordinator of the committee.

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Consent to participate –

The purpose of the study was explained to the participants in the Google Form. Confidentiality and secrecy about their identity was communicated at the very beginning of the questionnaire.

Consent for publication -

All 532 participants have consented for publication.

Availability of data and material –

A questionnaire (5 point Likert scale) was designed for the purpose of collecting the data. The data was collected through online mode using Google Forms.

Code availability

Data analysed with SPSS, 26.

Authors' contributions

Both the authors contributed to the study, design, analysis and discussion.

- Conceptualisation of the study: Delia Antão
- Methodology: Delia Antão
- Design of the tool: Delia Antão and Areena Fernandes
- Formal Analysis and Investigation: Delia Antão and Areena Fernandes
- Literature search : Delia Antão and Areena Fernandes
- Writing - Original draft preparation: Delia Antão
- Review and editing : Areena Fernandes

1.0. Introduction

The COVID-19 pandemic plunged the entire world into uncertainty. The strangely unpredictable and seemingly mysterious, uncontrollable illness unlike any known pandemic in history, has impacted the lives of individuals and families, social situations and economy, work, and careers. There seem to be fear and anxiety everywhere. Permanent changes in the type and use of power and resources has resulted in a complete paradigm shift to the digital mode of communication and interaction as the present-day normal. One of the seriously affected sectors of active life has been education. The global education system was compelled to shift almost overnight from the traditional mode of classroom teaching to a digital mode of instruction. The lockdown and measures of social distancing have posed several challenges to educators. Teachers have been struggling to adapt themselves to teaching students online to ensure continuity in their learning process. There are changes in the field of education occurring continuously with the validation of new theories of teaching and learning and the availability of new technologies that can enhance the teaching-learning process (NíShé et al. 2019). China was the first country to swiftly swing into action and engage the teaching fraternity into what is undoubtedly the largest online mode of teaching 'ever recorded in human history'. Their innovative practices helped them adopt a variety of models of online teaching (Yao, Rao, Jiang and Xiong 2020).

The unprecedented advancement in the field of Information and Communication Technology (ICT) and an array of digital resources have made multiple modes of digital education possible. The online teaching-learning process involving the synchronous as well as the asynchronous modes is possible on different digital platforms accessible via android phones and computers, provided there is steady internet connectivity. Online activities in education involve sharing a variety of digital resources via multimedia to facilitate online submission and evaluation of assignments.

In Goa too, the concerned authorities' sudden decision to get teachers ready for the online mode of teaching through a quick, short, and intense online pedagogical training program sent many in the teaching community into a tizzy. At the outset, teachers anxiously hurried to equip themselves with new devices and digital packages which would enable them to make the most of the brief training period. On the other hand, parents and students also scurried to get whatever it takes to remain in sync with the educational program.

However, the transition from traditional classroom teaching to remote digital teaching has not been without difficulties for teachers, managements of the educational institutions, and parents. Many factors can shape the reality of education in these difficult times; first and foremost, teachers need to

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be suitably trained for the online mode of teaching. They need a strong support system and encouragement to learn and teach online, from colleagues, family and management (Kearsley and Blomeyer 2004). Very often, teachers tend to continue with their traditional pedagogies rather than using online pedagogies. But these may not be as effective for online teaching and hence teachers need to be provided with professional development (Baran, et al. 2011; Bezuidenhout 2018; Meyer 2013, cited by NíShé et al. 2019). The quality and duration of training for online teaching-learning are very crucial at the beginning. Other hurdles include massive workload, the constraint on time, inadequate technological literacy, and the dilemma of the unreliable internet connectivity. Adding to this are the financial difficulties of the disadvantaged student populations, in acquiring the required gadgets and access to the internet. The problem of multiple languages and the disparity between children who are fortunate to have supportive parents engaged in their education and those who don't, are other factors to reckon with. However, teaching and learning practices today have come to greatly depend on the teachers' digital literacy, their knowledge, skills and their ability to utilise the various digital texts, platforms, and devices that make up the prevailing digital ecosystems in an optimal manner.

2.0. Research Review

2.1. Digital Literacy

Martin and Grudziecki (2015) defined ‘digital literacy’ by quoting Paul Gilster, who first popularised the term

> “The ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers. The concept of literacy goes beyond simply being able to read; it has always meant the ability to read with meaning and to understand. It is the fundamental act of cognition. Digital literacy likewise extends the boundaries of definition. It is the cognition of what you see on the computer screen when you use the networked medium. It places demands upon you that were always present, though less visible, in the analogue media of newspaper and TV. At the same time, it conjures up a new set of challenges that require you to approach networked computers without preconceptions. Not only must you acquire the skill of finding things, but you must also acquire the ability to use these things in your life.

Putting it simply, Greene (2018) says that digital literacy could refer to the knowledge and skills required to use the various digital tools, platforms, and devices that are available. According to Marsh, Hannon, Lewis and Ritchie (2017) and Thorne (2013), digital literacy is not a new concept. Though libraries were once considered to be storehouses of knowledge, today multimodal texts from a multitude of sources can be accessed right from where one is, using the internet, unhindered by time or space. Hence it is extremely necessary for teachers to acquire, maintain and enhance their knowledge and abilities to make maximum use of resources like digital texts, platforms, and devices (Thorne 2013).

In a society that is advancing in digital technology, teachers are expected to gain proficiency in digital literacy. They not only need to understand how to obtain the knowledge that is available but should also be able to use it meaningfully in a variety of educational as well as social contexts (Rosaen and Terpstra 2012). They not only need to know how to use digital knowledge effectively but also to evaluate what is available, to develop information management strategies for finding texts online, for evaluating those texts, and for distinguishing genuine websites from the fake… (Hafner 2015). Besides evaluating and using digital texts, documents and resources, it is imperative that teachers also effectively engage themselves in creating digital information (Myers, Erickson and Small, 2013). This requires critical thinking. In a multitude of apps and devices that are available, it takes a well informed and discerning mind to know how to choose and use a specific app or device to enhance the teaching-learning practices, which can then also be transferred to other contexts (Haugerud 2011). In fact, Greene (2018) believes that teacher educators must prepare teachers who can produce and utilise

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digital as well as print media as they exist today as well as design and plan for future media forms and formats that do not yet exist. After all,

> *"Digital literacy is fast becoming a prerequisite for creativity, innovation and entrepreneurship and without it, citizens can neither participate fully in society nor acquire the skills and knowledge necessary to live in the 21st century*". (European Commission, 2003: 3).

2.2. Training for Online Teaching

According to the Cambridge English dictionary, training is the process of learning the skills that you need to do a particular job or activity. Collier, Burkholder and Branum (2013) in the Policy Brief from the Committee for Economic Development, prepared in cooperation with the Texas Association of School Administrators and Fort Worth Chamber of Commerce, say that training for online teaching is a step in the professional development of teachers. It is a transition from the traditional mode to the digital mode of teaching for which teachers need to invest significantly in time and learning. Teachers need training to use technology comprehensively in instruction. By realizing the potential of the digital and technological resources they will be able to foster student learning and guide students through discovery learning and application of information. This training for online teaching needs to utilise technology not only to guide instruction but also 'to measure, evaluate and understand student learning through data-driven instructional methods'. The lack of proficiency in using technology will hinder the teachers' ability to avail of digital learning and technological resources effectively. However, to optimise technology for learning, they will require a new professional content-centred learning, on several key ideas and skills, as specified by the Policy Brief, such as:

- Instructional planning and decision-making using technology and the Internet;
- Designing relevant and rigorous learning tasks with the help of technologies and the Internet;
- Using various collaboration strategies to facilitate learning;
- Creating classroom systems and schedules to promote collaborative and independent learning;
- Evaluating learning (assessment, data-driven decision making, portfolios, etc.) through digital technologies;
- Establishing guidelines for the ethical and appropriate use of digital media and content;

To gain confidence and proficiency in using technology to design and guide instruction, policy makers, district authorities and schools need to ensure that teachers are:

- Provided multiple opportunities to avail of on-going professional development programmes either online or through face-to-face workshops.
- Given a follow-up support system where Instructional Technology-support teachers can assist classroom teachers in implementing strategies and activities learned in professional development.
- Committed to evaluate their effectiveness after completing a professional development programme.

The recent lockdown due to the COVID 19 pandemic forced all teachers teaching at different levels, to engage themselves in the online mode of teaching, almost immediately by incorporating digital technology into their teaching and instructional practices. Hence pedagogical and technical competency assumes utmost importance for online education during these uncertain times. Unfortunately, Dhavan (2020) citing Carey (2020) says that the emphasis was not so much on 'whether online teaching-learning methods could provide quality education', but on how online learning activities could be conducted on such a large scale.

A variety of strategies may be available for teaching in the online environment but appropriate techniques and adequate learning support should also be made available to teachers and students, preferably before the commencement of the online classes. The success of online education requires continuous improvement according to Dhavan (2020) through rigorous quality management programs

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as stated above. Research conducted by Badia, Garcia and Meneses (2019), suggests that teaching satisfaction depends upon the quality of the learning support that is provided in terms of techniques of instructional design. The ease with which teachers can handle technology determines how stressed or relaxed they feel in an online teaching and learning environment. However, there are several reasons why teachers find online training programs difficult to complete. A heavy workload of online classes, poor time management skills; several technical problems with hardware and poor internet connections prevent their wholehearted participation.

Unlike traditional classroom instruction, teachers engaged in online teaching need to be familiarised with various strategies to manage their quantum of workload, effort and time. They need to keep up with new developments in technology, manage the tedious open-ended task of student feedback; make their subject content available online at any time and most of all, avoid burnout which could be a bigger concern due to extra workload. Online teaching requires a lot of support especially in terms of technical assistance, instructional design assistance and time management. Hence time and again teachers need to participate in pedagogical development courses. Teachers will then be challenged by new theories of teaching and learning, and get drawn into a continuous process of learning that will take them beyond the boundaries of their own discipline and pedagogical field (Postareff and Nevgi 2015). A well-organized distance learning program should have properly trained resource persons to handle each of these types of support (Kearsley and Blomeyer 2004). Furthermore, pedagogical training not only enables teachers to be enriched by the teaching-learning process, which is so very crucial in planning for and teaching content, but also strengthens the teachers' self-efficacy beliefs (Postareff, Lindblom and Nevgi 2007).

2.3. Implementation of Online teaching

Online teaching is the "*delivery of instruction using different Web-based technologies, from the Internet or an intranet and other communication technologies that enable students to participate in learning activities beyond the campus, from students' homes to workplaces and other locations*" (Zhu, Payette, and DeZure 2003 as cited by Baylen and Zhu 2009).
Today's students are digital natives. Given an opportunity, their ability to handle technology is somewhat instinctive. According to Collier, Burkholder and Branum (2013), these digital-age students with their iPods, iPhones, and computer games, social media pages, and text messaging, have access to resources and knowledge far beyond traditional school structures and practices. They are "less dependent upon traditional education institutions for knowledge acquisition and are much more self-reliant, exercising their internet-based skills to aggregate data and information." Distance education now has been made easy and possible for the common man due to technological advancement and developments (McBrien et al. 2009). With the recent introduction of Massive Open Online Courses (MOOCs) in India, and several digital platforms that offer a variety of courses to students, e-learning has begun to gain popularity (Dhawan 2020). Yet many institutions in India were reluctant to move toward online teaching and learning. Teachers with extensive teaching experience are more likely to be resistant to change their teaching strategies or practices (Postareff and Nevgi 2015). This is because teachers are required to make extensive use of pedagogical skills for online teaching.

Research reveals that many teachers lack adequate technology based professional development. They have limited physical resources, inadequate resources, limited access to technology, lack of technical support, competence and confidence (Hadija and Shalawati 2017). Mathew and Iloanya (2016) also recognise the challenge teachers face to develop curricula that are exploratory in nature, to engage learners with hands-on, inquiry-based learning. Other negative emotions experienced by teachers concerning teaching online are a sense of restriction and intimidation by technology which often leaves them feeling frustrated and apprehensive (Regan et al. 2012). At certain times the feelings of helplessness and insecurity lead them to underestimate their self-worth. Wingo, Ivankova, and Moss (2017) carried out a synthesis of 67 empirical studies on teachers teaching online and reported that many teachers were quite concerned about their status as online teachers. They were worried about what image they would be creating as 'online teachers' especially if their competence was evaluated within the parameters considered for the online mode of teaching. Another issue that worried them

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was ‘time’. An unexpected increased workload seemed to hinder their performance. Time as a stressor was also reported by García-González, Torrano and García-González (2020). They found that pace and pressure of work, as well as the significant cognitive and motivational demands, are linked with the strict deadlines, characteristic of online teaching. They cite Sun et al. (2011); Maliket al. (2017) and Pace et al. (2019) who found that attempts to meet deadlines lead to an increase in working hours beyond the normal working schedules and cut into personal time as well as quality time that would otherwise be set aside for the family. Hadija and Shalawati (2017) too found that the lack of time to prepare a lesson using technology was a major challenge that teachers experienced. This concern regarding the amount of time that is needed to design and develop online courses is further endorsed by Wickersham and McElhany (2010).

Santilli and Beck (2005) state that in virtual learning environments, the self-esteem of the teachers becomes vulnerable when moving from a student-centred learning environment to a direct instructional approach. Though Regan et al. (2012) found that teachers also felt several positive emotions such as pleasure, pride, assurance, satisfaction as well as a feeling of rejuvenation due to the inbuilt convenience, intrigue and a feeling of liberation, Badia, Garcia, and Meneses (2019) did not find that greater experience in online teaching is associated with more comfort and confidence in teaching. Wickersham and McElhany (2010) claim that teachers also have several other concerns such as an apparent lack of social interaction during online lessons as well as inadequate preparation and training for students in the use of technology. If students were sufficiently trained in the use of information technology, there would be a considerable improvement in their academic output. (Tian 2018, cited by Yao, Rao, Jiang and Xiong 2020). To overcome this apprehension it is suggested that teachers teaching online should make the transition from ‘leaders’ to ‘helpers’ by giving students more autonomy in learning. The lack of motivation among students may have several reasons. But it is perhaps one of the major problems today that is undoubtedly affecting the performance of teachers teaching online. Wingo, Ivankova and Moss (2017) in their synthesis of 67 empirical studies about teachers teaching online, that were published between 1995 and 2015, also found that the teachers were particularly concerned about issues that affected student success. They found that students needed to be proficient in effective communication, technical proficiency, and legitimate achievement of learning outcomes without cheating. The findings of Mailizar, Almanthari, Maulina and Bruce (2020) prove that it is challenging for teachers to help students to benefit from online teaching if students were not prepared for e-learning before the pandemic.

Mathew and Iloanya (2016) also listed several benefits of online teaching and learning e.g. students can learn at their own pace, they can sharpen their higher-order thinking skills by interacting with the teacher and companions... teachers can have opportunities for real-time student assessment... However, as we have already seen there are challenges too, the major ones being the uncertain internet connectivity and the digital divide between financially disadvantaged students and others.

Online as well as face-to-face teaching in the traditional classroom set up, are emotionally equally demanding, though the latter has been under-researched as an educational topic (Badia, Garcia and Meneses 2019). The knowledge of how various factors affect the online teaching experience, and the emotional response of teachers to that experience, will convince educational institutions to extend the much-needed support and encouragement to their teachers in their online mode of teaching, which could not only bring them personal satisfaction but also enhance student learning (Rowe, Fitness and Wood 2013).

3.0. Significance of the Study

Most teachers in Goa have some basic knowledge and experience of using ICT and had been using social media as part of their teaching strategies prior to the pandemic. After the outbreak of the pandemic due to COVID-19, the school management and teachers were undeniably compelled to continue the teaching-learning process amidst the uncertainty and obstacles faced by the teachers as well as students. An unprecedented move to conduct a quick and short online training programme was

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undertaken to prepare teachers to conduct online lessons for students. How useful was the digital knowledge and how effective was the training, in translating that knowledge into successful online teaching?

This study aims at studying the relationship between the *Digital Literacy* of school teachers in Goa, the *Online Training Programme* conducted for teachers to equip them to teach online, and the *Implementation of Online Mode of Teaching* in schools, to maintain continuity in the students' learning process. In the absence of sufficient research conducted in this area concerning teachers and school education, the data obtained from this study could give a comprehensive idea of what the situation prevailing in Goa is, concerning online teaching in schools during the pandemic. It will help provide suggestions to help teachers make a relatively easy transition from traditional classroom teaching to more effective virtual teaching, which will in all probability continue to be the 'normal' even when someday COVID-19 becomes just a memory.

4.0. Method

4.1. Variables

a) Digital Literacy.

b) Online Training programme.

c) Implementation of Online Mode of Teaching.

4.2. Objectives

1. To determine the significant relationship between the *Digital Literacy* of the School Teachers and the *Online Training Programme* for online mode of teaching.
2. To determine the significant relationship between the *Online Training Programme* for online mode of teaching, conducted for school teachers in Goa, and the *Implementation of Online Mode of Teaching*.
3. To determine the significant relationship between the *Digital Literacy* of the School Teachers in Goa and the *Implementation of Online Mode of Teaching*.

4.3. Hypotheses

$H_0$1: There is no significant relationship between *Digital Literacy* of the School Teachers and the *Online Training Programme* for online teaching conducted for school teachers.

$H_0$2: There is no significant relationship between the *Online Training Programme* for online teaching conducted for school teachers, and the *Implementation of Online Mode of Teaching.*

$H_0$3: There is no significant relationship between the *Digital Literacy* of the School Teachers and the *Implementation of Online Mode of Teaching*.

H_a1: There is a significant relationship between the *Digital Literacy* of the School Teachers and the *Online Training Programme* for online mode of teaching conducted for school teachers.

H_a2: There is a significant relationship between the *Online Training Programme* for online mode of teaching conducted for school teachers, and the *Implementation of Online Mode of Teaching.*

H_a3: There is a significant relationship between the *Digital Literacy* of the School Teachers and the *Implementation of Online Mode of Teaching*.

4.4. Sample

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A total of 532 participants completed the survey.

4.5. Measures

4.5.1. Tool

A questionnaire based on 5 point Likert Scale was designed to collect data regarding the

- Digital Literacy of School Teachers,
- Online Training Programme conducted for school teachers for online mode of teaching.
- Implementation of Online Mode of Teaching.

4.5.2. Procedure

The aim of the study was to gain an understanding into the level of digital literacy among the school teachers in Goa. Consequently their perception about the training and implementation of the online mode of teaching during the COVID-19 pandemic was also studied.

The study was undertaken in the month of July till the second week of August 2020 while Goa was in and out of a lockdown due to the COVID-19 virus pandemic.

A Pilot Test was conducted by collecting data from school teachers in Goa through the online administration of a specially designed questionnaire based on the 5 point Likert Scale using Google Forms. The nature of the study and objectives were explained to the participants. Clear instructions regarding consent and the commitment to secrecy about the information they would provide were given to the participants at the beginning of the questionnaire. A set of 35 statements were given that included all the three categories or collecting data. Responses were collected on a scale ranging from Strongly Agree = 5, Agree = 4, Undecided =3, Disagree = 2, Strongly Disagree = 1. In all, 54 school teachers participated.

The statements of the questionnaire were then subjected to the Principal Component Analysis (PCA) after which the weak statements were eliminated and the strong ones were retained. This new set consisting of 24 statements was then divided into two groups A and B. Group A consisted of statements related to Digital Literacy and the other was related to Online Training and Online Teaching. The groups were then standardised using Cronbach's Alpha. The alpha coefficient for group A was found to be 0.810, and for group B it was 0.764. The standardised 5 point Likert Scale questionnaire was then used to collect the data through the online administration of the questionnaire using Google Forms. The responses were analysed with the help of SPSS v 26.

4.5.3. Statistical Technique for Analysis

The data was analysed using descriptive statistics and Correlational analysis using the Pearson Correlation Coefficient.

5.0. Results

This study examined the relation between the Digital Literacy of school teachers in Goa, their Online Training Programme for online teaching and the Implementation of the Online Mode of Teaching.

Table-1: Descriptive Statistics of Digital Literacy and Online Training Programme

Descriptive Statistics			
	Mean	Std. Deviation	N
Digital Literacy	35.83	6.949	532
Online Training Programme	18.59	3.805	532

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Table-2: Pearson's Correlation of Coefficient for measures of Digital Literacy and Online Training Programme

Correlations			
		Digital Literacy	Online Training Programme
Digital Literacy	Pearson Correlation	1	-.193**
	Sig. (2-tailed)		.000
	N	532	532
Online Training Programme	Pearson Correlation	-.193**	1
	Sig. (2-tailed)	.000	
	N	532	532
** Correlation is significant at the 0.01 level (2-tailed).			

The results shown in Table 2 suggest that there is a weak negative correlation between the Digital Literacy of the School Teachers in Goa and the Online Training Programme for online teaching. The correlation (r = -0.193) is significant at 0.01. Hence the null hypothesis was rejected and the H_a1 was accepted. The findings reveal that though the Digital Literacy of the School Teachers is high, it did not really promote the efficiency level expected through Training Programme conducted for school teachers for Online Teaching.

Table-3: Descriptive Statistics of Training Programme and Implementation of Online Teaching

Descriptive Statistics			
	Mean	Std. Deviation	N
Online Training Programme	18.59	3.805	532
Implementation of Online Mode of Teaching	35.41	5.470	532

Table-4: Pearson's Correlation of Coefficient for Measures of Training Process and Implementation of Online Teaching

Correlations			
		Online Training Programme	Implementation of the Online Mode of Teaching
Online Training Programme	Pearson Correlation	1	.557**
	Sig. (2-tailed)		.000
	N	532	532
Implementation of the Online	Pearson Correlation	.557**	1

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Mode of Teaching	Sig. (2-tailed)	.000	
	N	532	532
**. Correlation is significant at the 0.01 level (2-tailed).			

From the results shown in Table 4, it is seen that there is a significant positive correlation between the Online Training Programme of the school teachers in Goa, and the Implementation of the Online Mode of Teaching. The correlation (r = 0.557) is significant at 0.01. Therefore, the null hypothesis is rejected and the H_a2 is accepted. The data obtained implies that the Online Training Programme organised for the school teachers in Goa, had a direct impact on the Implementation of the Online Mode of Teaching.

Table-5: Descriptive Statistics of Digital Literacy and Implementation of Online Teaching

Descriptive Statistics			
	Mean	Std. Deviation	N
Digital Literacy	35.83	6.949	532
Implementation of the Online Mode of Teaching	35.41	5.470	532

Table-6: Pearson's correlation of coefficient for measures of Digital Literacy and Implementation of Online Teaching

Correlations			
		Digital Literacy	Implementation of the Online Mode of Teaching
Digital Literacy	Pearson Correlation	1	-.210**
	Sig. (2-tailed)		.000
	N	532	532
Implementation of the Online Mode of Teaching	Pearson Correlation	-.210**	1
	Sig. (2-tailed)	.000	
	N	532	532
**. Correlation is significant at the 0.01 level (2-tailed).			

The results shown in Table 6 reveal that there is a weak negative correlation between the Digital Literacy of the School Teachers and the Implementation of Online Teaching programme in Goa. The correlation (r = -0.210) is significant at 0.01. Hence the null hypothesis is rejected and the H_a3 is accepted. The findings disclose that though the Digital Literacy of the School Teachers is quiet high, it somehow did not help the teachers in successfully implementing the Online Mode of Teaching. This could be due to the direct impact that the training programme for online teaching had on the implementation of the online mode of teaching.

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6.0. Discussion

The first objective of the present study was to examine the nature of the relationship between the Digital Literacy of School Teachers and their Online Training Programme for the online mode of teaching. As shown in Table 2, there exists a negative correlation between the digital literacy of school teachers in Goa and the online training programme for the online mode of teaching. From the information gathered from the respondents, it is rather interesting to note that 60% of the teachers are below the age of 45 years and over 65% of the total number of teachers was quite familiar with the basics of ICT. Of the teachers under study, 84% revealed that they had a very clear idea about using MS Word before the training. This indicates that most teachers used this programme for their school-related work and did not necessarily require training for the same. The reason for the inability to use MS Word by the small minority of respondents, who disagreed with the statement, could probably be their dependence on others to carry out their computer-related tasks. It could be that these teachers were nearing retirement and had not found the need for digital proficiency. However, according to Gruszczynska, Merchan and Pountney (2013), research suggests that teachers as well as teacher educators must have on going opportunities "to engage in digital literacies". Hence, the online training programme for online teaching that was organised by the Department of Education was a good opportunity for professional advancement besides using it as a means for continued education of the students. With their ICT background knowledge, one would expect the teachers to complete the online training programme for online teaching that was organised by the Department of Education. However, the compulsion to shift to online lessons with a training programme of a mere four days duration became a virtual nightmare especially for the older teachers and those nearing retirement. This is understandable because though the majority of the teachers have been using the media and Google search engine for teaching, only 22.7% of the respondents were familiar with the various digital platforms needed for digital teaching.

The responses of the subjects indicate that the training programme packed too much information and skills in too short a time. The teachers struggled to make time to practice the newly acquired skills. Secondly, the timing was inconvenient because most of the high school teachers were engaged in the Central Assessment Programme of Std. X examinations during those days. Goa is made up of villages; many areas face the problem of poor transport systems which became even more acute during the lockdown period. Several teachers, especially the older ones, do not have personal transport. With 86.8% of our respondents being women, they had responsibilities at home with household chores to attend to, children, and in some cases, invalid members to care for. This left them little time and energy to follow the online training programmes that sometimes went on till very late in the evenings. For most teachers practicing the skills meant burning the midnight oil. The next formidable obstacle was the poor mobile network and internet system. In some homes, there was no privacy. A common place of internet access had to be shared not only by teachers but also by the other working members of their families.

The older teachers (45 years and above) who made up 38.9% of the respondents, and who were not so tech-savvy, found it very difficult to keep pace with the training programme. This made them feel all the more anxious and stressed. A separate training group, with more emphasis on the fundamentals of ICT, could have been organised for the older teachers for optimum learning. Several older teachers became heavily dependent on the younger teachers who in turn felt stressed because of the compulsion to divide their attention between their own learning process and guiding their older colleagues.

After the training programme, 38.2% of the teachers felt that they were still not familiar with or rather, not confident enough to handle the pedagogy required for effective online teaching and 16.5% were undecided whether they had mastered the skills sufficiently well. The latter group is significant as it includes some of the younger teachers as well. This indicates that although a

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significant number of teachers were already familiar with the use of technology in the teaching process, they still lacked confidence in the effective pedagogy for online teaching.

The training programme in terms of its timing, duration, and content also took a toll on the health of the respondents. The long hours on end spent in the training process resulted in the considerable physical strain as expressed by 78.7% of the teachers. Left with no choice, skills had to be practiced until late into the night, resulting in a strain on their eyes as reported by 80.3% of the subjects under study. The only time available at a stretch for learning and practicing what was taught during the training sessions were late nights. This in turn affected their health as reported by 58.2% of teachers who admitted to suffering from mental fatigue. Only a small group of 22.9% of the teachers were able to cope comfortably. Probably this included 22.7% as stated above who were already familiar with the various online teaching platforms. It must be noted that unfortunately, 56.6% of the respondents were not satisfied with the competence of some of the resource persons who conducted the training sessions. They found that the instructors were somehow unable to understand some of the needs of the teachers particularly concerning the various subjects they taught. Only a meagre 3.9% strongly agreed that they benefitted from resource persons.

The second objective of the present study was to examine the nature of the relationship between the Online Training Programme of school teachers for online teaching and the Implementation of Online Teaching. The data in table 4 indicate that there exists a positive correlation between the Online Training Programme of the school teachers and the Implementation of the Online Teaching programme. First and foremost, a great majority of the teachers had to battle with poor internet connectivity. The rainy season that normally begins in June and extends up to August, brings to the State of Goa, heavy rains and lashing winds that often result in an electrical power failure, disruption in telephone services, and consequently the poor internet connections just heighten their woes. As was discussed in the first objective, there was much lacking in the manner in which the online training programme was conducted for the school teachers in preparation for online teaching. Many teachers felt that they were forced into hurriedly taking a plunge into online teaching without adequate preparation i.e. 48.8% said that they did not have sufficient time to practice the new skills before they began teaching online. While 7.3% of the teachers couldn't decide whether they needed more time for practice, only 8.8 % strongly agreed to have had adequate time at their disposal. Although they were relatively well versed in digital literacy, they were still required to practice the new skills they had gained during the training programme. This would enable them to use their previous knowledge of technology to effectively conduct online teaching.

With having to spend a considerable amount of time in intense training sessions, and having to continuously focus on the computer/mobile phone screen for a prolonged period, 80.3% of the teachers admitted to suffering from a lot of strain on the eyes, 35% of whom strongly agreed to have had to endure this discomfort. Due to long hours of practice, 78.7% of the subjects also experienced physical fatigue. Unfortunately as reported earlier, more than half of the teachers, i.e. 56.6% were unhappy with some of the resource persons who conducted the online training. Had the resource persons been able to give time and attention to some of the finer points of the digital teaching-learning process, then perhaps the teachers, most of who were already well versed with the basics in the use of IT, would have derived optimum benefit from the training. This would have been advantageous for greater success in the implementation of the online teaching process.

As for the teachers and the implementation of online teaching, most of the teachers seemed unable to give of their best as observed from their responses to specific questions. For example, 62.3% of the subjects found online teaching a complicated process with 21.6% of the teachers strongly agreeing to this. More than half the number of respondents i.e. 61.3% felt overwhelmed by the excessive use of technology and 62.4% admitted that they sometimes felt helpless using the technology required for online teaching. In all, 80.1% found the process of evaluation very tedious. As for getting all students to pay attention to what is being taught during an online class, 89.6% of the teachers have been feeling very disheartened. As mentioned earlier, 76.6% of teachers found that planning and preparation for online lessons took up the time that they could otherwise have spent on household chores or leisure activities. After all the planning, hard work, and sacrifice, they found that it takes

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considerable effort to even motivate all students to be attentive or engage themselves in the activities conducted for them online. And one is never sure whether it has worked. Many teachers have been complaining that some students watch late-night TV programmes and are reluctant to get out of bed in time for class the following day.

Since the start of online teaching, teachers have been compelled to give their phone numbers to the students. As a result, in all 87.8% of the respondents claimed that many students now communicate with them even at odd hours of the day much to their dismay. It was seen that 87.8% of the teachers found themselves at their wits' end when, after a very stressful day of work, students keep calling up even at nights to clarify doubts regarding content, schedules or even to complain about poor internet connectivity while uploading worksheets, assignments and projects within the specified time. Hence 66.9% of the teachers do not really favour teaching students whom they cannot see all together as a class and interact with them. Only 3.2% of the teachers had no problems teaching students they do not see. The teachers appeared so stressed out by this whole process of online teaching that 91.9% have expressed their wish to go back to regular classroom teaching because according to 84.4% of the teachers, they felt that classroom teaching was less stressful than online teaching.

The third objective of this study was to determine the significant relationship between the Digital Literacy of the School Teachers in Goa and the Implementation of Online Teaching. As seen in Table 6, there exists a negative correlation between Digital Literacy and the Implementation of Online Teaching. It is heartening to know that 89.1% of the respondents were already well versed with some of the online search engines for information such as Google, Yahoo, etc. Only 38.2% were unfamiliar with an effective pedagogy for online teaching. This speaks well for the teachers in Goa and their ability to use technology in the teaching-learning process. It further endorsed the fact that teachers were rather proficient in accessing the internet for information about their lessons.

Nearly half the population strongly agreed, and an additional 30% agreed that they were confident in the use of Microsoft PowerPoint to create presentations before the training programme. This is a reflection of how teaching has been changing progressively over the years with a large number of teachers already using computer-aided instruction in the classroom even before the pandemic.

With 74.1% of the respondents stating that they were unaware about options like Google Meet, Google Forms and Google Classrooms, it is evident that teachers were familiar with the use of technology to enhance the teaching-learning process within the conventional classrooms, but not necessarily familiar with the use of technology for online teaching. However, these teachers wouldn't need much effort besides the training programme conducted for them, to learn about the use of the same. Unfortunately, in the online training programme that was conducted, the trainers seem to have failed to build on and enhance the existing knowledge and skills of the teachers as expressed by 56.6% of the respondents. Initially, few teachers were selected as Master Trainers who would be guided to subsequently train their fellow teachers. Many teachers who were selected as Master Trainers felt as if they were suddenly groping in the dark as they struggled to come to terms with managing multiple tasks simultaneously. The abrupt decision to have the training programme alongside the SSC Board exams added to the teachers' woes as they juggled with the task of being Exam Centre Conductors, Invigilators and Master Trainers. If at this level, the Master Trainers were counselled and guided in a well-phased manner as opposed to the hurried training, they would perhaps be better equipped to guide their colleagues. Thus some of the teachers were unable to assimilate the new knowledge and skills to enhance their performance in the currently imposed imperative of compulsory online teaching.

Another major obstacle to the smooth online teaching-learning process was poor connectivity. It must be noted that this sudden paradigm shift from traditional classroom teaching to digital teaching failed to assess the ground reality. The formidable exercise of completely shifting to digital learning without assessment of the situation was mismanagement of a plan if there was any. There was not only a need to have adequate resources firmly in place and a sound pedagogy for the online teaching-learning process, but it was necessary to have taken into confidence the various stakeholders, especially the

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various School Managements as well as parents who had to be in a position to arrange for the e-resources needed for the smooth conduct of the digital learning system.

7.0. Conclusion and Suggestions

It may be difficult to predict how long the pandemic will stretch, but there is not the slightest doubt that the digital teaching-learning process will be an indispensable mode of instruction at least in the near future. A blended mix of face-to-face and online delivery is inevitable with far greater emphasis on the latter (Sangster, Stoner, and Flood 2020). The sooner teachers come to terms with this reality the better it would be for their teaching efficacy. They need to constantly update themselves about the new technological developments and get familiarised with the emerging innovative ideas and concepts in digital learning. As the online environment changes and new technologies become available, the nature of the online educator role will change e.g. process facilitator; adviser-counsellor; assessor; researcher; content facilitator; technologist; designer; manager-administrator (NíShé, et al. 2019). Different teachers are at different positions on the continuum of digital literacy. Given the quantum of digital knowledge and skills required to teach online with fluency and the paucity of time in which to learn it, many teachers could be provided with a system of shortcuts to make their tasks a little more manageable. Since the needs of each teacher in the domain of digital knowledge and skills differ when it comes to learning and increasing one's competence, there could be a digital literacy framework in place for everyday teaching and learning practices (Greene 2018). Institutions can periodically organise refresher courses as part of their teacher development programmes to enable teachers to be more conversant with the enormous amount of e-content and e-resources that are available. This will help them in their choices, to select wisely and gain greater confidence and satisfaction in their work and profession. Students and teachers also need to be alerted and instructed about cyber security and related issues. Online evaluation is another area that needs careful planning, extensive preparation and efficient management.

While the process of digital learning moves from strength to strength, the teacher-student relations can be enhanced for better performance e.g. according to Dhawan (2020),

- Students can be given orientations as to how they could optimise the available resources intelligently to their advantage.
- Programs should be creative, interactive, relevant, student-centred, and group-based.
- Online courses should be periodically revisited to ensure that they are dynamic, interesting, and interactive. Various teaching strategies such as lectures, case studies, debates, discussions, experiential learning, brainstorming sessions, games, drills, etc. can be used to facilitate effective and efficient online teaching and learning practices
- Personal attention could be given to students to help them adapt better to the online learning environment. Social media and various group forums can also be used to communicate with students.
- Students need to be kept attentive and proactively engaged in learning by setting time limits and reminders.
- Citing Abdous (2011) and Corfman and Beck (2019), NíShé, et al. (2019) emphasise that students can be motivated to learn if given timely and quality feedback in the form of constructive criticism, reassurance, clarifying doubts and providing additional information.

Several Socio-economic and political issues also need to be addressed for maximising resources to benefit digital education such as are mentioned by Sangster et al. (2020):

- regular power supply,
- steady internet connectivity with the desired bandwidth for institutions and teachers at affordable rates,
- quiet spaces for online classes being conducted simultaneously for the various classes,
- Access to appropriate e-material and resources.

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- Availability of required gadgets for students at suitable concession for the financially disadvantaged learners.

8.0. Scope for Further Research

Further research in the following areas could strengthen the whole thrust of online teaching and ensure that it becomes more efficient and effective during the pandemic and post pandemic period.

- A study on the mental, emotional and psychological wellbeing of teachers, and their coping mechanism during the pandemic.
- A study on the mental, emotional and psychological wellbeing of students, and their coping mechanism during the pandemic.
- The emphasis today being on inclusive education, teachers also need to be trained to cater to children with special needs, in their classrooms. Some of these children have to move between academic resource rooms and regular classrooms. A study could be carried out on the type of training given to the teachers to cater to the needs of these academically diverse groups.
- Autistic children, who are on the lower side of the spectrum, need the services of a shadow teacher or an itinerary teacher, besides learning to socialise with other children in a regular classroom. It is extremely challenging for parents of these children to help them with academics alongside their other needs in these difficult times through home schooling. A study could be made on the efforts of the Departments of Education and the various Educational Institutes to reach out to these children in the absence of regular classroom interactions.
- A study could be done to document the efforts made by the Departments of Education and the various Educational Institutes in the different States to train teachers for online teaching to take care of the academic needs of children with special needs enrolled in their schools.
- A study could also be undertaken to document the efforts made by the various Departments of Education in different States vis-à-vis the ground reality of services offered to children with special needs.

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