Are the teacher trainees digital literates at Tiruchirapalli District? - A study

Dr. R. Balamurugan[1] & Dr. S. Ravivarman[2]

[1]ICSSR Post Doctoral Fellow & [2]Associate Professor

[1,2] Department of Education,

Tamil University,

Thanjavur – 613 010.

Tamil Nadu. India.

Abstract

Digital literacy is a new era skill rallying today in the educational system. Teachers are expected to be digitally literate especially in teaching to the digital generation learners. Teacher trainees are the future teachers to be engaged the digital generation learners and digital literacy is essential to them. In order to assess the digital literacy of the teacher trainees the study was undertaken. A digital tool was developed and administered to a random sample of 1000 teacher trainees. The data were collected and subjected to descriptive and inferential analysis. The geographical location was limited to Triuchirappali district. Gender and parent occupation is found significant difference and others such as locale, type of family and residential area are found no significant difference in digital literacy of the teacher trainees.

Keywords: *Digital Literacy, teacher trainees, random sample, inferential analysis*

1. Introduction

Recent digital technologies have shifted the educational practices and methodologies toward collaborative and computer-aided learning. These digital technologies have permeated our all activities from workplace to personal engagements. It raises questions whether the Net generation needed modern technologies to support self directed learning or collaborative learning or both like blended learning. The educational reformers mend the torn pieces of quality of education and universalisation of education through the integration of digital technologies which are readily and easily available in the digital society. The digital boom in the information society in the first decade of the 21st century resulted in a shift in educational practices in tertiary as well as in secondary education (Tick, 2018).

Every program has specific outcomes, but the most common outcome is to inculcate knowledge among the incumbents for further studies or professional competencies (Chakraborty, Kanti& Santra,2018). Though institutions make steps to improve digital literacy, web literacy and e-learning in educational institutions, the proliferation of digital technologies is falling short of skilled workers who could handle them for efficient teaching and learning. Digital skilled teachers deliver their content successfully and effectively instead of digitally unskilled teachers. Teachers are expected to be digitally literate to handle the digital generation learners. A proliferation of definitions around digital competence and digital literacy has emerged with variant terms used and different nomenclature (Martzoukou et.al, 2020). Digital literacy covers both the ability to use basic computer functions, as well as using ICT for problem solving and supporting critical thinking (Bonner & Godin, 2019).

Teachers of 21st century are known to be active associates in using technology and the technology knows how that either facilitates or hinders learning. The ubiquitous resources when exploited properly produce extraordinary results among the learners. In this sense, it is essential to study the use of digital technologies and the digital literacy of the teacher trainees or prospective teachers. Prospective teachers are near to digital natives since the technologies boomed during the early years of the kids who are training themselves as teachers today. The problem and the way they handle the digital technologies might be different from other teachers who are not digital natives. The prospective teachers' digital literacy might produce a different perspective, in which this study has paced its objective. Thus, the present study was aimed at studying the digital literacy of teacher trainees in the district of Tiruchirappalli.

2. Literature Review

Digital literacy is important to adopt changes over time and Usage of digital usage is increased for the past 2 years because of wider option of digital platforms introduced in this period (Revathi & Sathya, 2020). Nowadays, the development of new learning expectations for pupils and new digital technologies have necessitated that teachers continuously rethink their pedagogical practices (Sailin & Mahmor, 2018 as cited in Olavi & Ruokamo, 2021).While digital literacy initially focused on digital skills and stand-alone computers, the focus has shifted from stand-alone to network devices including the Internet and social media (Gomathy,2019). The use of technology in the classroom is one of the important concerns that slowly integrates into advancing the education system in all levels starting from preliminary level to the tertiary level of education (Alakrash, Abdul & Krish, 2021).

The design of teaching activity and the flexible application of technology tools or digital learning therefore become the primary issues for current information technology integrated education (M.-H. Lin et al, 2017). Schools start using technology in education for a variety of reasons, and nowadays they often invest in digital tools (Haelermans, 2017). It important to investigate the impact of digital and information literacy skills on education but concurrently to pay equal attention to individuals' intention to use digital technology (Nikou1 & Aavakare, 2020).Staff who are digitally fluent "can blend many innovative pedagogical practices such as flipped learning, digital curation, and m-learning techniques, and use open educational resources (OEDs) to their maximum benefit" (Higher Education Academy, 2017 as cited in McGuinness &Fulton,2019).

Teachers no longer supply instructional resources to conventional learning platforms because it affects students' interest and motivation in obtaining and improving their learning. Therefore, in order to be literate in digital media learning nowadays, teachers are expected to develop digital technologies (Saripudin, 2021). Digital technology has been deemed able to change the learning methods of students and has become an integral requirement in their lives (Prasetyo & Anggraeni, 2020).Empirical findings may show that there may be diverse motivations in favour or against digital learning among different demographics. For example, the individual students' gender, age as well as their position in the social strata may affect their disposition to using educational technology to learn subjects (Antony & Caterina, 2017).

3. Methodology of the study

Methodology includes the followings.

3.1 Variables used in the study

The following variables have been used by the investigator and they are:

- ✓ Dependent Variable: Digital Literacy
- ✓ Independent Variable: Gender, Locale, Medium of Instruction, Type of Family, Parent Occupation, and Residential Area.

3.2 Method

A descriptive survey method was adopted for the present study.

3.3 Sample and sampling method

A random sample of 1000 teacher trainees was selected from 8 teacher training institutions comprising of rural and urban locale at Tiruchirappalli district.

3.4 Tool of the study

The investigator has developed digital literacy tool which consist of 30 items and the responses of each items vary from Always, Often, Sometimes and Never. Face and content validity were found. The reliability of the tool was found to be 0.71 by using split half method.

3.5 Statistical techniques adopted

The investigator has adopted following statistical techniques.

- ✓ Descriptive Analysis – Mean & Standard Deviation
- ✓ Inferential Analysis – t-test & ANOVA

3.6 Objectives of the Study

➢ To assess the level of digital literacy among the teacher trainees of Tiruchirappalli district.

➢ To find out the significance difference in digital literacy among the teacher trainees of Tiruchirappalli district concerning to the sub-variables, such as,

    ✓ Gender,

    ✓ Locale,

    ✓ Medium of Instruction,

    ✓ Type of Family,

    ✓ Parent Occupation, and

    ✓ Residential Area

3.7 Hypothesis of the Study

➢ The level of digital literacy among the teacher trainees of Tiruchirappalli district is average.

➢ There is no significant difference between male and female teacher trainees in their digital literacy.

➢ There is no significant difference between urban and rural teacher trainees in their digital literacy.

➢ There is no significant difference between English and Tamil medium teacher trainees in their digital literacy.

➢ There is no significant difference between nuclear family and joint family teacher trainees in their digital literacy.

➢ There is no significant difference among the teacher trainees in their digital skills based on their parent occupation.

➢ There is no significant difference between home and hostel teacher trainees in their digital literacy.

Hypothesis 1 (H_o1)

There is no significant difference between male and female teacher trainees in their digital literacy

Table 1: Mean, Standard Deviations and 't' values of Male and Female teacher trainees in their digital literacy Scores

Variable	Gender	N	Mean	Standard Deviation	"t" value	Level of Significance
Digital Literacy	Male	514	131.98	18.743	3.182	**Significant at 0.05 level**
	Female	486	127.98	20.906		

From the table 1, it is evident that the t'-value of digital literacy between male and female teacher trainees is 3.182 which is greater than the critical value of 1.96 with the degrees of freedom 998 and it denotes significance exist between them at 0.05 level. It is concluded that the teacher trainees differ significantly in their level of digital literacy. Thus the null hypothesis "There is no significant difference between male and female teacher trainees in their digital literacy" is rejected. It may, therefore, be concluded that male and female teacher trainees show statistically significance of difference in their digital

literacy and the hypothesis is restated as there is significant difference between male and female teacher trainees in their digital literacy and considered as finding.

Hypothesis 2 (H₀2)

There is no significant difference between urban and rural teacher trainees in their digital literacy.

Table 2: Mean, Standard Deviations and 't' values of urban and rural teacher trainees in their digital literacy score

Variable	Locale	N	Mean	Standard Deviation	"t" Value	Level of Significance
Digital Literacy	Rural	264	129.13	19.741	0.860	Not Significant at 0.05 Level
	Urban	736	130.36	19.980		

From the table 2, it is evident that the t'-value of digital literacy score of rural and urban teacher trainees is 0.860 which is less than the critical value of 1.96 with the degrees of freedom 998 and it denotes significance not exist between them at 0.05 level. It is concluded that teacher trainees do not differ significantly in their digital literacy based on their locale. Thus the null hypothesis "There is no significant difference between rural and urban teacher trainees in their digital literacy is accepted.

Hypothesis 3(H₀3)

There is no significant difference between English and Tamil medium teacher trainees in their digital literacy.

Table 3: Mean, Standard Deviations and 't' values of English Medium and Tamil Medium teacher trainees in their digital literacy

Variable	Medium of Instruction	N	Mean	Standard Deviation	"t" Value	Level of Significance
Digital Literacy	Tamil	541	131.09	20.554	1.789	Not Significant at 0.05 Level
	English	458	128.82	19.089		

From the table 3, it is evident that the 't' value of digital literacy score of English medium and Tamil medium teacher trainees is 1.789 which is less than the critical value of 1.96 with the degrees of freedom 998 and it denotes significance not exist between them at 0.05 level. It is concluded that teacher trainees do not differ significantly in their level of digital literacy sub grouped on the basis of medium of instruction. Thus the null hypothesis "There is no significant difference between English medium and Tamil medium teacher trainees in their digital literacy" is accepted.

Hypothesis 4 (H₀4)

There is no significant difference between nuclear family and joint family teacher trainees in their digital literacy.

Table 4: Mean, Standard Deviations and 't' values of Nuclear and Joint Family teacher trainees in their digital literacy

Variable	Type of Family	N	Mean	Standard Deviation	"t" Value	Level of Significance
Digital Literacy	Nuclear	780	129.96	20.017	0.281	**Not Significant at 0.05 Level**
	Joint	219	130.38	19.616		

From the table 4 , it is evident that the 't'value of digital literacy score of nuclear and joint family teacher trainees is 0.281 which is less than the critical value of 1.96 with the degrees of freedom 998 and it denotes significance not exist between them at 0.05 level. It can be affirmed that teacher trainees do differ significantly in their level of digital literacy when sub-grouped into nuclear and joint family. Thus, the stated null hypothesis "There is no significant difference between nuclear and joint family teacher trainees in their digital literacy" stands accepted.

Hypothesis 5 (H₀5)

There is no significant difference among the teacher trainees in their digital skills based on their parent occupation.

Table 5 Summary of ANOVA Showing the Significance of Difference of digital literacy scores of teacher trainees sub-grouped on the basis of Type of School

Sources of Variation	Sum of Squares	df	Mean Square	Calculated 'F' Value	Table Value 'F'	Sig.
Between Groups	5511.916	2	2755.958	7.033	3.09	.001
Within Groups	390681.715	997	391.857			
Total	396193.631	999				

From the table 5, it can be seen that the ANOVA comparisons show significant difference with p=.001 (df= 2,997) at 0.05 level of significance. The calculated 'F' value (7.033) is higher than the table value 'F'(3.09), which adds to the significance of difference between the groups in their digital literacy. Hence, the null hypothesis 'There is no significant difference among the teacher trainees in their digital skills based on the parent occupation, is rejected**.**

On identification of the significant difference in the groups, Tukey's HSD, a post hoc comparison test was performed, to analyze further the difference in which two groups is significant. The Table 5a gives the post hoc comparisons.

Table 5a Showing the Post Hoc Comparisons between the Groups

Type of Occupation	Type of Occupation	Mean Difference	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Lower Bound
Government	Private	4.594*	1.551	.009	.95	8.23
	Others	5.362	1.533	.001	1.76	8.96
Private	Government	-4.594	1.551	.009	-8.23	-.95
	Others	.768	1.519	.868	-2.80	4.33
Others	Government	-5.362*	1.533	.001	-8.96	-1.76
	Private	-.768	1.519	.868	-4.33	2.80

From the table 5a, it shows the significance differences among government, private and other teacher trainees in their digital literacy. Significant difference exists between government and private teachers and no significant difference exists government and private, and private and others teacher trainees in their level of digital literacy.

Hypothesis 6 (H$_o$6)

There is no significant difference between home and hostel teacher trainees in their digital literacy.

Table 6 Mean, Standard Deviations and 't' values of Home and Hostel of teacher trainees in their digital literacy Scores

Variable	Residential Area	N	Mean	Standard Deviation	"t" Value	Level of Significance
Digital literacy	Home	915	130.24	19.563	1.302	**Significant at 0.05 Level**
	Hostel	82	126.83	22.968		

From the table 6, it is seen that the 't'value of digital literacy score of home and hostellers teacher trainees is 1.302 which is greater than the critical value of 1.96 with the degrees of freedom 998 and it denotes significance exist between them at 0.05 level. It is concluded that teacher trainees differ significantly in their level of digital literacy sub-grouped into home and hosteller teacher trainees. Thus the null hypothesis "There is no significant difference between home and hostel teacher trainees in their digital literacy skill" is rejected. It may, therefore, be concluded that home and hostel trainees show statistically significance of difference in their digital literacy. The hypothesis can be restated as *"There is significant difference between home and hostel teacher trainees in their digital literacy"*. This difference can be attributed to the availability and accessibility of digital literacy for teacher trainees from home than the teacher trainees who stay in hostel.

Analysis and Discussion of Findings

Gender differences were found in the sample. The male participants were found to have higher mean than the females. At the same time locale did not play the significant role in determining the digital literacy of the teacher trainees. It was found that the medium of instruction and status of the family whether it is a nuclear or joint family also did not affect the digital literacy of the teacher trainees. Interestingly, parent occupation differs significantly in the teacher trainees, on one side it may be taken as the socio economic status of the teacher trainees. Hence the teacher trainee's digital literacy was affected by parent education, this may due to the digitally literate parents may tend to educate and support the use of digital technologies by their wards. In addition to that the place of stay also shows a statistical difference in the digital literacy of the teacher trainees. The result may due to the reason that the availability and ease of access is more for home staying than the hostellers where herding hinders access to the internet due to poor internet connection at times. In general, the gender and the socio-economic status of the sample where demographic variables that affect the digital literacy of the teacher trainees of Tiruchirappalli District. Similar study can be done in different geographical area and a different level of the sample. Teachers particularly female teachers can be trained in use of digital gadgets and awareness and intervention programmes may be organize for the same. Teacher education institutions may develop proper infrastructure and offer orientation and the use of digital technologies in the teacher's classroom and in teaching. Curriculum developers may develop teacher appropriate curriculum for the changing roles and demands expected off from the teachers of digital natives.

Conclusion

The study attempted to analyse the digital literacy of the teacher trainees. The findings show a racial inclusive teacher training for the teachers to accommodate digital technologies and have digital literacy. The teachers are to be trained in the use of computer and other technological devices in their teacher education programme and there of in the real classroom where they would be teacher Z generation who are born embracing digital technologies.

References

Alakrash, Hussien, et al. "Social Network Sites in Learning English; an Invstigation on Attitudes, Digital Literacy and Usage." *LinguisticaAntverpiensia*, vol. 2021, no. 1, 2021, pp. 26–43, https://www.hivt.be/linguistica/article/view/72.

Bonner, Euan, and Sam Godin. *Exploring IPad Digital Literacy in Japanese Freshman Students*. no. August, 2019, https://www.kandagaigo.ac.jp/kuis/cms/wp-content/uploads/2018/04/11-1.pdf.

Chakraborty, Debarun, et al. "Effectiveness of ICT in Strengthening the Process of Higher Education System in India." *Amity Journal of Management Research*, vol. 3, no. 1, 2018, pp. 40–53, https://amity.edu/UserFiles/admaa/3b0a0Paper 4.pdf.

Haelermans, Carla. *Digital Tools in Education. On Usage, Effects and the Role of the Teacher*. 2017, https://www.scienceguide.nl/wp-content/uploads/2018/07/digital-tools-in-education.pdf.

Lin, Ming Hung, et al. "A Study of the Effects of Digital Learning on Learning Motivation and Learning Outcome." *Eurasia Journal of Mathematics, Science and Technology Education*, vol. 13, no. 7, 2017, pp. 3553–64, doi:10.12973/eurasia.2017.00744a.

Martzoukou, Konstantina, et al. "A Study of Higher Education Students' Self-Perceived Digital Competences for Learning and Everyday Life Online Participation." *Journal of Documentation*, vol. 76, no. 6, 2020, pp. 1413–58, doi:10.1108/JD-03-2020-0041.

McGuiness, Claire, and Crystal Fulton. "Digital Literacy In Higher Education: a Case Study Of Student Engagement With e-Tutorials Using Blended Learning." *Journal of Information Technology Education: Innovations in Practice*, vol. 18, no. January 2011, 2010, pp. 1–28, https://www.informingscience.org/Publications/4190.

Nikou, Shahrokh, and MillaAavakare. "An Assessment of the Interplay between Literacy and Digital Technology in Higher Education." *Education and Information Technologies*, Education and Information Technologies, 2021, doi:10.1007/s10639-021-10451-0.

Prasetyo, P. Eko, and Oki Anggraeni. "The Effectiveness of Digital Literacy in Economic Learning." *DinamikaPendidikan*, vol. 15, no. 2, 2020, pp. 136–47, doi:10.15294/dp.v15i2.26474.

Sangwan, Anupma, et al. "Development and Validation of an Attitude Scale towards Online Teaching and Learning for Higher Education Teachers." *TechTrends*, vol. 65, no. 2, TechTrends, 2021, pp. 187–95, doi:10.1007/s11528-020-00561-w.

Saripudin, S., et al. "Digital Literacy Skills of Vocational School Teachers." *Journal of Engineering Science and Technology*, vol. 16, no. 1, 2021, pp. 666–80, https://jestec.taylors.edu.my/Vol 16 issue 1 February 2021/16_1_46.pdf.

Sung, Wookjoon. "A Study on the Effect of Awareness and Education on Digital Literacy." *Information (Japan)*, vol. 20, no. 7, 2017, pp. 5289–99, https://www.proquest.com/docview/2018997443?pq-origsite=gscholar&fromopenview=true.

Tick, Andrea. "Research on the Digital Learning and E-Learning Behaviour and Habits of the Early Z Generation." *INES 2018 - IEEE 22nd International Conference on Intelligent Engineering Systems, Proceedings*, no. June, 2018, pp. 000033–38, doi:10.1109/INES.2018.8523906.

Väätäjä, JanneOlavi, and HeliRuokamo. "Conceptualizing Dimensions and a Model for Digital Pedagogy." *Journal of Pacific Rim Psychology*, vol. 15, 2021, doi:10.1177/1834490921995395.