

AWARENESS AND UTILIZATION OF E-ASSESSMENT TOOLS AMONG SECONDARY LEVEL TEACHERS

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Abstract: Assessment is essential for the improvement of educational processes and the development of educational systems. With the advancement of technology in education, traditional assessment methods have been replaced with electronic assessments (e-assessments), especially during the COVID-19 pandemic. The core aim of this research study is to analyze the level of awareness and utilization of E-assessment tools, which are crucial to sustaining in the field of education in the current era. The data was collected through the survey questionnaire. 320 secondary level teachers from Government schools, Government Aided schools, and Private schools in and around Karaikudi area participated in this study. The results obtained from the statistically analyzed data reveal that, the level of awareness of e-assessment tools among secondary level teachers is moderate and the level of utilization of e-assessment tools among secondary level teachers is low. In addition, there exist no gender difference among secondary level teachers in the level of awareness and utilization of e-assessment tools. There exists a significant difference in the level of awareness of e-assessment tools with respect to the type of management. In light of these results, teachers should be aware of recent technologies in education and pay attention to the technical way of assessing students' abilities.

Keywords: E-assessment, E-assessment tools, Awareness, Utilization, Secondary level teachers.

1. Introduction

“In teaching and learning, technology is changing pedagogical practices, and with the advent of e-learning solutions, the Internet is revolutionizing instructional delivery methods” (Bahati *et al.*, 2019, p. 62). Skills such as problem solving, critical thinking, collaboration, and creativity are seen as key to 21st century education. When an educator wants to support students' acquisition of these skills, he or she must use assessment methods that make these skills explicit. It is necessary to assess student learning outcomes in order to determine what students are ready to learn next. The purpose of assessment in the present century is increasingly broad and it takes a greater variety of forms. Developing assessment material that reflects newly emerging educational priorities will be challenging in the present era. An assessment process will be required in order to

prepare the next generation with the abilities and values necessary to address the emerging global challenge. The new educational paradigm brings online assessment or electronic assessment (e-assessment) to assess the learners, which is gaining popularity in India, especially during the COVID-19 outbreak. Gupta *et al.*, (2019) defines e-assessment as “the use of information technology in innumerable ways to assess the performance and measure student learning”. E-assessment tools refer to software or application that are used to evaluate the performance of students. Today, a wide range of e-assessment tools are accessible, each of which performs its function in a unique way. Some of the most popular and commonly used e-assessment tools are Socrative, Google Forms, Mentimeter, Poll Everywhere, Kahoot, Plickers, QuestBase, ClassMarker and so on. COVID-19 brings important changes to all fields, especially education. The role of online learning is essential in the Indian education system during the pandemic. It is important to recognize the implications of e-assessment in the educational process because it is one of the significant applications of e-learning technology (Abdou, 2020). E-assessment tools help in assessing students' academic performance. There are a number of potential benefits for teachers and students with e-assessment tools. E-assessment tools help students become more passionate in their learning. It provides greater flexibility for learning.

A digital revolution in education has already been prompted by globalization. Teachers can conduct classes, share resources, and assess students' progress via a variety of online platforms. Online assessment tools measure student performance and provide insight into their levels of knowledge in a specific subject. A variety of e-assessment tools are available for use during the learning process and beyond. Lack of awareness on such tools may hinder the assessment process. Therefore, it has become necessary to conduct a systematic study in order to find out whether the teachers are aware of and use e-assessment tools in the classroom. So, the main focus of this present study is to analyze the level of awareness and utilization of e-assessment tools among secondary level teachers.

2. Literature Review

A variety of tools and applications have emerged in our virtual world to make learning more engaging. E-assessment tools facilitate learning through games, quizzes, and other methods for students to demonstrate their knowledge. Using them, instructors can quickly create quizzes and share with their students. According to the study of ALShaikh (2020), the finding shows that faculty use of diagnostic e-assessment was low and formative and summative e-assessment was medium. The majority of teachers use Online Formative Assessment Tools (OFAT) to evaluate students' performance, but some challenges such as teachers' age, school location, and facilities make implementation difficult (Remmi & Hashim, 2021). The opinions of teachers on e-assessment are influenced by personal attributes such as their age and teaching experience (Kuppers & Schroeder, 2020). The benefits offered by technological apps and programs made e-assessment popular among teachers for formative evaluation (Al-Hattami and Abdulghani, 2020). A majority of teachers agree that online assessment can be achieved using various e-assessment tools (Wahid *et al.*,2020). According to the study by Al-Azawei *et al.*, (2019), using educational

technologies to assess learners' knowledge and understanding is beneficial for teachers. Qualifications Framework with e-assessment tools that end up in awarding statements of attainment or qualifications will eventually leads to the e-assessment have a bright future (Bawa, 2016). Based on their responses, COVID appeared to increase students' interest in e-assessment (Kundu & Bej, 2021). The review of the related research helped the researcher from the methodological point of view. Tularova et al. (2015) and Remmi & Hashim (2021) adopted a survey method to analyze a teachers' attitude towards the use of e-assessment in Bulgaria and Saudi respectively. Also Al-Hattami & Abdulghani (2020), Mohammadi (2021), Asad *et al.*, (2021) and Chinnathambi & Latha (2021) employed quantitative research approach and the responses were gathered via a structured survey questionnaire to investigate the effectiveness of online teaching and online assessment tools. As a result of the aforementioned reviews, the survey method was most suitable for the present study to analyze the level of awareness and utilization of e-assessment tools. Reviewing and abstracting all the studies carried out both in India and abroad, the researcher has come to a conclusion that hardly studies have been done on the awareness and utilization of e-assessment tools with reference to secondary level teachers. In this sense, the present study is unique and significant against the series of research studies covered in this review.

3. Research questions

Q1. What is the level of awareness and utilization of e-assessment tools among secondary level teachers?

Q2. Is there any significant correlation between awareness and utilization of e-assessment tools among secondary level teachers?

Q3. Do the level of awareness and utilization of e-assessment tools among secondary level teachers differ due to gender?

Q4. Do the level of awareness and utilization of e-assessment tools among secondary level teachers differ due to type of management?

4. Methodology

4.1. Research Method and Research Instrument

In light of the study aim and nature of the problem concerned, the present study adopted the Survey method. The researcher uses a simple random sampling technique to reach the desired population. The sample of the present study comprises secondary level teachers in and around Karaikudi locality, Tamil Nadu. The investigator has developed a survey questionnaire as a research instrument in this present study. The instrument was developed based on the literature review. The questionnaire has two parts with personal data sheet. Personal data sheet consists of two sociodemographic variables questioning teachers' gender (Male/Female) and type of management of the school working on (Government/ Government Aided/ Private). Part-A of the questionnaire consists of 12 dichotomous questions (1-Yes or 0-No) which measure the level of

awareness of the e-assessment tools among secondary level teachers. Part-B consists of 16 questions designed to measure the level of utilization of e-assessment tools among secondary level teachers. The responses were graded on a 4-point scale ranging from 0-Never,1-Rarely, 2-Sometimes and 3-Always. Bilingual version of the questionnaire was administered (Tamil and English). Before the actual data collection, the investigator conducted a pilot study to examine the internal consistency of the questionnaire. The questionnaire was administered to 30 secondary level teachers from various schools in Karaikudi, Sivagangai District, Tamilnadu.

4.2 Validity and Reliability

The survey questionnaire was endorsed for validity by two research experts in the field of educational research. The questionnaire was revised according to their suggestions and opinions. The researcher used Cronbach's Alpha Reliability analysis to calculate the internal consistency coefficients of the items included in the questionnaire. This was done through a pilot study with 35 randomly selected secondary school teachers. Result of the reliability analysis showed that Part –A questionnaire has an internal consistency of 0.81 whereas Part – B has 0.87 respectively (shown in Table 1). Based on these values, it can be determined that the tool is highly reliable (Hair *et al.*, 2010) and had a satisfactory discriminating power.

Table 1

Cronbach’s Alpha Reliability Analysis

Variable	No. of Items	Cronbach's Alpha
Awareness	12	0.806
Utilization	16	0.873

4.3 Data collection

The data were collected from 320 secondary level teachers from Government, Government Aided and Private schools. Printed questionnaire was distributed to the targeted sample, emphasizing that their participation would be voluntary. When data collection was underway, the purpose of the survey was explained to teachers, and clarifications were provided as necessary. Incomplete responses were then discarded from the collected data. The final sample included 320 survey responses which were analyzed statistically. Table 2 summarizes the demographic profiles of respondents

Table 2

Demographic data of the respondents (N=320)

	Frequency	Percentage
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<i>Gender</i>		
Male	61	19.1
Female	259	80.9
<i>Type of Management</i>		
Government	60	18.7
Government Aided	77	24.1
Private	183	57.2

5. Data analysis

The final data collected through the questionnaire were analyzed with statistical procedures like descriptive analysis and differential analysis through SPSS (version 23) software. In descriptive analysis, Mean, Standard Deviation (SD), Percentage Analysis, Product Moment Coefficient Correlation were calculated, whereas in differential analysis t – test and ANOVA were employed for computing the data that are collected and subjected to the statistical findings.

Table 3

Percentage Analysis of the level of awareness with respect to the demographic variables

Demographic variable	Category	Low		Moderate		High	
		No.	%	No.	%	No.	%
Gender	Male	18	29.5	28	45.9	15	24.6
	Female	96	37.1	96	37.1	67	25.9
Type of Management	Government	20	33.3	24	40.0	16	26.7
	Government Aided	37	48.1	23	29.9	17	22.1
	Private	57	31.1	77	42.1	49	26.8
Total (N=320)		114	35.6	124	38.8	82	25.6

Table 3 shows the results of a percentage analysis of the level of awareness of e-assessment tools with respect to gender and type of management. From the total number of male teachers (n=61), 29.5% have low, 45.9% have moderate and 24.6% have high level of awareness on e-

assessment tools. From the total number of female teachers (n=259), the equal percentage (37.1%) of teachers have low and moderate level of awareness and 25.9% have high level of awareness of e-assessment tools. From the total number of teachers from Government (n=60), Government Aided (n=77) and Private schools (n=183), 33.3%, 48.1% and 31.1% have low level, 40%, 29.9% and 42.1% have moderate level and 26.7%, 22.1% and 26.8% have high level of awareness of e-assessment tools respectively. From the total value it is inferred that the awareness of e-assessment tools among secondary level teachers is moderate (38.8%) with respect to demographic variables.

Table 4

Percentage Analysis for the level of utilization with respect to the demographic variables

Demographic variable	Category	Low		Moderate		High	
		No.	%	No.	%	No.	%
Gender	Male	10	16.4	30	49.2	21	34.4
	Female	103	39.8	76	29.3	80	30.9
Type of Management	Government	12	20.0	30	50.0	18	30.0
	Government Aided	28	36.4	20	26.0	29	37.7
	Private	73	39.9	56	30.6	54	29.5
Total (N=320)		113	35.3	106	33.1	101	31.6

Table 4 shows that the result of the level of utilization of e-assessment tools with respect to gender and type of management. From the total number of male teachers (n=61), 16.4% have low, 49.2% have moderate and 34.4% have high level of utilization of e-assessment tools. From the total number of female teachers (n=259), 39.8% have low, 29.3% have moderate and 30.9% have high level of utilization of e-assessment tools. From the total number of teachers from Government (n=60), Government Aided (n=77) and Private schools (n=183), 20%, 36.4% and 39.9% have low level, 50%, 26% and 30.6% have moderate level and 30%, 37.7% and 29.5% have high level of utilization of e-assessment tools respectively. From the total value it is inferred that the utilization of e-assessment tools among secondary level teachers is low (35.3%) with respect to demographic variables.

Table 5

Correlation analysis

Variables	Awareness	Utilization
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Awareness	1.00	
Utilization	0.423**	1.00

** . Correlation is significant at 0.01 level (2-tailed)

Researcher computed Pearson product-moment correlation coefficients (r) to determine the correlations between Awareness and Utilization. Table 5 reveals that there is significant positive correlation between awareness and utilization of e-assessment tools (r = 0.423). These two variables are significantly inter-correlated with each other at 0.01 level (Table 5).

Table 6

Significance test of main variables with respect to gender

Variables	Category	Mean	SD	t value	P value
Awareness	Male	9.15	1.631	0.42	0.675
	Female	9.05	1.928		
Utilization	Male	32.81	7.797	1.927	0.057
	Female	30.62	8.662		

Using a t-test, it was examined whether the level of awareness and utilization of e-assessment tools among secondary level teachers differ between male and female. The test analysis (Table 6) showed that there is no gender bias among secondary level male and female teachers in the level of awareness (p>0.05) and utilization (p>0.05) of e-assessment tools.

Table 7

Significance test of main variables with respect to type of management

Variables	Source of Variance	Sum of Squares	df	Mean of Squares	F value	P value
Awareness	Between Group	26.0.7	2	13.044	3.781	0.024
	Within Group	1093.535	317	3.450		
Utilization	Between Group	355.909	2	177.954	2.465	0.087
	Within Group	22886.713	317	72.198		

ANOVA was used to determine whether secondary level teachers in Government, Government Aided, and Private schools differ statistically in their level of awareness and utilization of e-assessment tools. The test analysis (Table 7) showed that there is a statistically significant difference among the level of awareness of secondary level teachers in Government, Government Aided and Private schools ($p < 0.05$). So Duncan test was applied to measure the specific differences between pairs of means. The results of the Duncan Post-Hoc test (Table 8) show that, among the 3 groups, teachers in Government and Private schools have similar levels of awareness about e-assessment tools ($\alpha = 9.23$). Also from Table 8, it is inferred that the teachers of Government Aided schools are less aware of e-assessment tools when compared to their counterparts. Furthermore, there exist an absence of significant difference among secondary level teachers in Government, Government Aided and Private schools in their utilization of e-assessment tools.

Table 8

Duncan’s Post-Hoc test

Family monthly income	N	Subset for alpha = 0.05	
		1	2
Government	60		9.23
Government Aided	77	8.56	
Private	183		9.22
Sig.		1.000	.974

6. Findings and Discussion

Q1. What is the level of awareness and utilization of e-assessment tools among secondary level teachers?

The shift from traditional teaching methods to online delivery presents a number of challenges, particularly when it comes to assessment. However, the incorporation of digital tools and educational resources can enhance the teaching and learning experience and create a more engaging classroom environment (Haleem *et al.*, 2022). The present study aimed at examining the level of awareness and utilization of e-assessment tools among secondary level teachers. Results from tables 3 and 4 indicated that the secondary level teachers have a moderate level of awareness and low level of utilization of such tools. This conclusion was based on the demographic variables of the respondents, namely gender and type of management. These findings are consistent with

previous findings by Al Shaikh (2020), which found a low level of utilization of diagnostic e-assessment and medium level of utilization of formative and summative e-assessment from a faculty perspective. According to Kundu and Bej (2021), the e-assessment system has not been widely adopted in the Indian higher education system. To increase its usage, Koppers and Schroeder (2020) suggest that transparency is necessary when implementing e-assessment, in order to persuade teachers to accept it as a significant part of the examination process. One of the main reasons for the low adoption rate of e-assessment may be distrust, as stated by Rolim and Isaias (2019). Furthermore, Remmi and Hashim (2021) found that teachers prefer traditional assessment methods to online assessment methods.

Q2. Is there any significant correlation between awareness and utilization of e-assessment tools among secondary level teachers?

To determine the linear relationship between key variables, a correlation test was conducted. A Pearson correlation coefficient (r) test was conducted to assess the correlation between awareness and utilization. The correlation coefficient provides a numerical value that indicates the strength of the relationship between the two variables, ranging from -1 to 1. According to Table 5, the research results show a positive correlation between awareness and utilization with r value of 0.423 at the 0.01 level of significance. This suggests that a higher level of awareness leads to a wider utilization (Barandon & Atian, 2016). However, even though teachers have awareness about e-assessment, it can be difficult for them to implement it without proper training and technical support (Adenuga, 2020). Many teachers believe that specific training on e-assessment tools would be beneficial (Demirkan *et al.*, 2017). Therefore, it is important to provide proper adequate training and technical support to teachers for effective utilization of e-assessment tools. To increase the level of awareness and utilization of such tools, it is recommended that appropriate training on e-assessment tools should be included in both pre-service and in-service training programs for teachers.

Q3. Do the level of awareness and utilization of e-assessment tools among secondary level teachers differ due to gender?

Based on the results of the t-test presented in Table 6, it was found that the level of awareness and utilization of e-assessment tools between male and female secondary level teachers did not exhibit any statistically significant differences. This finding is consistent with the results of a study conducted by Nagamani & Muthuswamy (2013), which found no significant gender-based differences in the use of ICT for professional purposes among secondary school teachers in Tamil Nadu. Similarly, there were no significant gender-based differences in e-assessment technique utilization among respondents (AlShaikh, 2020). Additionally, the study by AlTameemy *et al.*, (2020) showed that there were no notable differences between male and female learners in experiencing challenges when utilizing e-assessment.

Q4. Do the level of awareness and utilization of e-assessment tools among secondary level teachers differ due to type of management?

The ANOVA results presented in Table 7 indicate that secondary level teachers in Government, Government Aided, and Private schools do not exhibit any significant differences in their utilization of e-assessment tools. However, there is a statistically significant difference in their level of awareness regarding e-assessment tools. Further analysis using the Duncan Post-Hoc test reveals that Government and Private school teachers have similar levels of awareness, while Government Aided school teachers have lower levels of awareness. Teachers in rural Government schools believe that ICT can impact teaching and can be used as a tool for teaching and learning (Sudha, 2019). The UDISE+ report for the academic year 2021-22, released by the Department of School Education and Literacy, Ministry of Education, Government of India (n.d), states that 43.5% of government schools in Tamil Nadu have functional ICT labs, while government-aided schools in the same state do not have any functional ICT labs (p.185). Moreover, the department initiates the implementation of ICT in government and government-aided secondary and higher secondary schools subsumed in Rashtriya Madhyamik Shiksha Abhiyan (RMSA), and the National Award for innovative use of ICT is presented annually to motivate teachers and teacher educators to use ICT creatively in teaching and learning (Department of School Education & Literacy, Ministry of Human Resource Development, Government of India, 2016).

It is essential to have computers and laptops in order to use e-assessment tools since they provide a platform for storing and accessing digital assessments. Through them, learners can interact with assessment software, complete exams online, and submit answers electronically. So that Rajeswari (2017) recommended that, in this digital age, prospective teachers must be aware of and trained on appropriate use of techno gadgets for effective teaching. In order to achieve the intended learning outcomes and enhance students' abilities to deal with the demands of the digital era, modern assessment techniques are essential. The use of digital technologies in assessment encourages teachers to make use of them (Amante et al., 2019). Through the use of e-assessment tools, it possible to evaluate different types of assessment, whether it is formative, summative or diagnostic, in a more efficient and accurate manner. Also, the use of these tools in education today has proven to be a sustaining agent for maintaining the quality of education. Throughout the history of education, the role of the teacher has changed as a result of a variety of intertwined influences in philosophy, psychology, social behavior, as well as technology. The paradigm shifts in education is from the subject of instruction to the nature and needs of the learners in a complex society. A fundamental part of understanding education trends is understanding how technological changes affect classroom use (Dube & Wen, 2022). According to the findings of this study, teachers should adapt themselves to incorporating technology in their classrooms regardless of their gender, age group, experience level, or background. It is crucial that teachers equip themselves for a technology-based approach to teaching. National Education Policy 2020 states that, “the relationship between technology and education at all levels is bi-directional; thus the thrust of technological interventions will be for the purposes of improving teaching-learning and

evaluation processes, supporting teacher preparation and professional development, enhancing educational access” (Ministry of Human Resource Development, Government of India, 2020, pp. 56-57). For teachers to be successful in the 21st century, they need to prepare themselves for the use of technology. The results of the present study proved that the awareness and utilization of educational technology is very much needed for the teachers because in this modern world teacher cannot remain in isolation or following outmoded traditional teaching- learning methods.

7. Conclusion and Recommendations

In response to the new learning scenarios created by technological development and particularly Web 2.0, school educators need to rethink their teaching practices, especially at the level of awareness strategies designed to align with the current paradigms. Since the advent of the Internet and online software stores, a wide variety of digital tools have become available for any task, and those intended for digital assessment have risen exponentially. There is a wide variety of assessment tools available, varying in terms of functionality, pedagogical quality, cost, operating system, etc. In order to make the teaching-learning process more effective, teachers should be guided in selecting the most effective e-assessment tools. Awareness and utilization of e-assessment tools are essential for the teachers to assess the distance learners in online learning to avoid educational gap during the COVID- 19 pandemic. Based upon the findings of the study, the following recommendations were made by the researcher. Teachers who are shaping the destiny of the nation should take note on the recent developments in education in general and educational technology in particular. The curriculum planners should give preference on educational technology in teacher preparation program and hands-on training in leveraging technology-based resources, which is needed for this digital era to meet the requirements of today's learners. The authorities of the Government should provide the technical support to the educational institutions and should motivate the in-service teachers by giving incentives to utilize ICT in teaching-learning. The findings of the present study are very important for the teachers, educationists as well as authorities of Government in order to develop new technological skills among teachers. Also, the present study is fruitful in the sense to understand that it is an urgent need for implementing the new curriculum or revising the existing curriculum based on ICT for teacher preparation program. In order to take further research efforts, the researchers may work on other variables, such as compatibility, readiness, effectiveness and so forth. The present study was limited on secondary level teachers; the same study can be conducted at various levels of education.

References

Abdou, R. A. E. (2020). Effects of e-Assessment Tools in academic achievement and motivation towards learning among pre service kindergarten teachers in Turaif. *Amazonia Investiga*, 9(28), 211-224. <https://doi.org/10.34069/AI/2020.28.04.24>

- Adenuga, K., Tripathi, R., & Miskon, S. (2020, July). Investigating the role of technical support in the adoption of e-assessment in India. In *Proceedings of EDULEARN20 Conference* (Vol. 6, p. 7th). doi: [10.21125/edulearn.2020.0144](https://doi.org/10.21125/edulearn.2020.0144)
- Al-Azawei, A., Baiee, W. R., & Mohammed, M. A. (2019). Learners' Experience Towards e-Assessment Tools: A Comparative Study on Virtual Reality and Moodle Quiz. *International Journal of Emerging Technologies in Learning*, 14(5). <https://doi.org/10.3991/ijet.v14i05.9998>
- Al-Hattami, Abdulghani. (2020). E-Assessment of Students' Performance During the E-Teaching and Learning. 29. 1537-1547.
- ALShaikh, A. A. (2020). The Degree of Utilizing E-Assessment Techniques at Prince Sattam Bin Abdulaziz University: Faculty Perspectives. *Journal of Educational and Social Research*, 10(4), 238-238. <https://doi.org/10.36941/jesr-2020-0081>
- ALTameemy, F. A., Alrefae, Y., & Alalwi, F. S. (2020). Using blackboard as a tool of e-assessment in testing writing skill in Saudi Arabia. *Asian ESP*, 16(6.2).
- Amante, L., Oliveira, I. R., & Gomes, M. J. (2019). E-Assessment in Portuguese Higher Education: Framework and Perceptions of Teachers and Students. In *Handbook of Research on e-Assessment in Higher Education* (pp. 312-333). IGI Global. DOI: 10.4018/978-1-5225-5936-8.ch013
- Asad, M. M., Khan Soomro, R. B., Shamsy, A., & Churi, P. (2021). Students' Satisfaction towards E-Assessment for Academic Achievement in ESL at Public Schools and Colleges. *Education Research International*, 2021. <https://doi.org/10.1155/2021/4576750>
- Bahati, B., Fors, U., Hansen, P., Nouri, J., & Mukama, E. (2019). Measuring learner satisfaction with formative e-assessment strategies. *International Journal of Emerging Technologies in Learning*, 14(7). <https://doi.org/10.3991/ijet.v14i07.9120>
- Barandon, S. B., & Atian, D. F. (2016). Awareness and Utilization of Classroom Assessment Techniques in Higher Education: The Case of a State College in Bicol. *Asia Pacific Journal of Multidisciplinary Research*, 4(2).
- Bawa, D. S. (2016). E-Assessment: An emerging green paradigm for higher educational structures in the Indian context. *MAKE IN INDIA*, 232.
- Chinnathambi, K., & Latha Anandan. (2021). Online Teaching and Online Assessment Tools; A Critical Study. *SPAST Abstracts*, 1(01).
- Demirkan, Ö., Gürışık, A., & Akın, Ö. (2017). Teachers' opinions about 'pickers' one of the online assessment tools. *Educational research and practice*, 476-486.

- Department of School Education & Literacy, Ministry of Human Resource Development, Government of India (2016, March 11). Information and Communication Technology (ICT): Overview. https://www.education.gov.in/en/ict_overview
- Department of School Education and Literacy, Ministry of Education, Government of India. (n.d). Report on Unified District Information System for Education Plus (UDISE+) 2021-22. https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/udise_21_22.pdf
- Dubé, A. K., & Wen, R. (2022). Identification and evaluation of technology trends in K-12 education from 2011 to 2021. *Education and information technologies*, 27(2), 1929-1958.
- Gupta, A., Gupta, K., Joshi, A., & Sharma, D. (2019). Tools for e-assessment techniques in education: A Review. *Handbook of Research on E-Assessment in Higher Education*, 28-52. DOI: 10.4018/978-1-5225-5936-8.ch002
- Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2010). *Multivariate Data Analysis*. Seventh Edition. Prentice Hall, Upper Saddle River, New Jersey.
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*. <https://doi.org/10.1016/j.susoc.2022.05.004>
- Kundu, A., & Bej, T. (2021). Experiencing e-assessment during COVID-19: an analysis of Indian students' perception. *Higher Education Evaluation and Development*, 15(2), 114-134. <https://doi.org/10.1108/HEED-03-2021-0032>
- Küppers, B., & Schroeder, U. (2020). Teacher's Perspective on e-Assessment: A Case Study from Germany. In *CSEDU (1)* (pp. 503-509). Teacher's Perspective on e-Assessment: A Case Study from Germany. In *CSEDU (1)* (pp. 503-509). DOI: 10.5220/0009578105030509
- Ministry of Human Resource Development, Government of India (2020, July 29). National Educational Policy 2020. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
- Mohammadi, A (2021). E-assessment Architecture for Higher Education: A Case Study of University Entrance Exam, Higher Education of Afghanistan.
- Nagamani, D., & Muthuswamy, P. (2013). Teacher's Professional Use of Information and Communication Technology in Secondary Schools in Tamil Nadu, India. *International Education Studies*, 6(12), 64-73. <http://dx.doi.org/10.5539/ies.v6n12p64>
- Rajeswari, G. (2017). Utilization of technogadgets among prospective teachers. *PARIPEX -Indian Journal of Research*.

- Remmi, F., & Hashim, H. (2021). Primary school teachers' usage and perception of online formative assessment tools in language assessment. *International Journal of Academic Research in Progressive Education and Development*, 10(1), 290-303. <https://doi.org/10.6007/IJARPED/v10-i1/8846>
- Rolim, C., & Isaias, P. (2019). Examining the use of e-assessment in higher education: teachers and students' viewpoints. *British Journal of Educational Technology*, 50(4), 1785-1800. <https://doi.org/10.1111/bjet.12669>
- Sudha, S. (2019). Does ICT Influences Rural Government School Teachers Beliefs? -Exploring Teachers Opinion on Usage of ICT as Teaching and Learning Tool. *Executive Editor*, 10(2), 163.
- Tuparova, D., Goranova, E., Voinohovska, V., Asenova, P., Tuparov, G., & Gyudzhenov, I. (2015). Teachers' Attitudes Towards the Use of E-Assessment—Results from A Survey in Bulgaria. *Procedia-Social and Behavioral Sciences*, 191, 2236-2240. <https://doi.org/10.1016/j.sbspro.2015.04.493>
- Wahid, Rizwana & Farooq, Oveesa. (2020). Online Exams in the Time of COVID-19: Quality Parameters. *International Journal of Social Sciences and Educational Studies*. 7. 13-21. 10.23918/ijsses.v7i4p13. <http://dx.doi.org/10.23918/ijsses.v7i4p13>

DECLARATIONS

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Data Availability

All empirical data is available upon request to the corresponding author, but the requests will be evaluated individually to ensure their validity and purpose. The provided copies will be anonymized.

Ethics/Originality

The research conducted in Tamil Nadu, India followed the highest ethical standards to ensure data integrity, participant data protection, and confidentiality protocols. The study was based on intensive surveys, and the write-up of the findings mainly focuses on the survey data.

Authors contributions

The authors take sole responsibility for the conceptual framework of the study, design, data collection, data analysis, interpretation of results, and manuscript preparation.

Conflicts of interest

There are no potential conflicts of interest in this study.

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