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Evaluating Digital Competencies of Elementary Grade Teachers in Mayurbhanj District: An Analytical Study

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Abstract

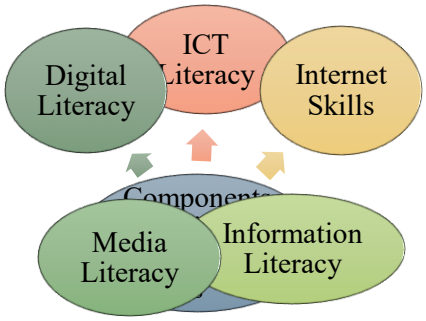
In the contemporary educational landscape, digital competency has become a cornerstone of effective teaching and learning process. As educational institutions strive to integrate technology into their curricula, the competency of teachers in digital skills is increasingly recognized as a critical factor in achieving successful educational outcomes. Digital competency encompasses a wide range of skills, including the ability to use digital tools, navigate online resources, and integrate technology into pedagogical practices in the classroom situations. The study was conducted on 120 elementary grade teachers of Mayurbhanj district of Odisha, India. The investigator adopted the descriptive survey research design to evaluate the digital competencies of elementary grade teachers in Mayurbhanj district of Odisha. For the collection of samples for the study, stratified and simple random technique was used. The finding of the study revealed that there is no significant difference between the digital competencies of male and female elementary grade teachers of Mayurbhanj district. Also, there exists a statistically significant difference between the digital competencies of urban and rural elementary grade teachers of Mayurbhanj district. Moreover, there exists a statistically significant difference between the digital competencies of teachers with HES and LES in Mayurbhanj district. Further, greater emphasis disposed to rural teachers by improving infrastructure, providing digital devices, and increasing opportunities and engagement with ICT tools. Similarly, to mitigate the digital competency gap, LES teachers must receive enhanced access to technology, training opportunities, and financial assistance to strengthen their digital skills. In addition to this, educational implications and recommendations were given on the basis of obtained findings of the study.

Key Words: *Digital Competencies, Elementary Grade Teachers, High Economic Status (HES), Low Economic Status (LES), Information Communication Technology (ICT), National Education Policy (NEP)-2020etc.*

Introduction

In today's society, the modern generations are required to have an advanced level of digital competence, as they are in continuous transformation, the learning habits of students have changed, their needs and circumstances are no longer the same as decade ago. To mitigate these needs, a teacher entails an updated training on digital tools and possesses a degree of digital competence to undertake the teaching-learning process of learners. Digital competence is a set of skills, competencies, knowledge and attitudes that teachers must have in order to make a critical, dynamic and creative use of Information Communication Technology (ICT) in their classrooms. It includes 21st century skills, ICT skills, technology skills, media literacy, digital literacy, and digital skills. Digital competencies encompass the necessary skills and knowledge required to effectively navigate and interact with the digital world. These competencies are crucial as technology evolves rapidly, and it's important to understand the distinct elements that make up digital competence. The key components of digital competencies include the following:

- **ICT Literacy**: It refers to the ability to use digital devices, applications, and software to access, manage, and exchange information. It involves understanding how computers, networks, and digital tools work.
- **Internet Skills**: Internet skills focus on how to effectively use the internet to search for and retrieve information. It includes knowing how to use search engines efficiently, evaluating the reliability of online sources, understanding how to communicate and collaborate online, and using web-based tools.
- **Information Literacy**: It is the ability to locate, evaluate, and use information from a variety of sources. It enables us to critically assess online content, identify trustworthy sources, and distinguish between accurate and misleading information.
- **Media Literacy**: Media literacy refers to the ability to critically analyze and evaluate media messages, whether they are traditional or digital. It involves understanding how media content is created, recognizing biases, and being able to interpret and respond to media in an informed and responsible way.
- **Digital Literacy**: Digital literacy involves the critical thinking skills needed to navigate online environments safely, responsibly, and creatively. It includes not only the ability to use technology effectively but also understanding the social, ethical, and legal implications of digital media.



(Fig. 1: Components of Digital Competencies)

Together, these five areas form the foundation of digital competencies, which are essential for individuals to thrive in the modern, technology-driven world.

In today's knowledge-based society, digital technologies play a vital role in driving innovation, economic growth, and offering new opportunities for individuals globally. These technologies are transforming how we communicate, learn, work, access information, and spend our free time for growth and development of individuals. People use the internet and digital tools for a wide range of activities, from accessing resources and creating content to sharing information and connecting with others around the world. In today's rapidly advancing technological landscape, the integration of digital tools in education has become essential to enhance the teaching-learning process. The ability to effectively utilize digital platforms and resources is now considered a critical competency for teachers. Digital competency skills empower teachers to create engaging and interactive learning environments, improve classroom management, and support diverse learning needs. In elementary education, the adoption of these skills is even more significant as young learners are growing up in an increasingly digital world. National Education Policy (NEP)-2020 and initiatives like NIPUN (National Initiative for Proficiency in Reading with Understanding and Numeracy) Bharat emphasize the need for digital literacy and the development of digital skills among both students and teachers. These policies recognize the pivotal role that teachers play in fostering digital literacy in young learners and advocate for the continuous professional development of teachers in digital competencies. The ability to navigate digital tools, design online and blended learning experiences, and utilize digital assessments has become a necessity in ensuring quality education. NEP-2020, Foundational Literacy and Numeracy (FLN) Model Schools initiative, and NIPUN Bharat Mission are interconnected frameworks aimed at transforming education in India, particularly in the context of enhancing foundational skills among young learners. The success of these initiatives is significantly depending on the digital competency skills of elementary grade teachers. Teachers equipped with digital skills leverage technology to create engaging learning environments, implement interactive teaching methods, and assess student performance more effectively and efficiently. In Mayurbhanj district, enhancing teachers' digital competencies is essential for the effective implementation of these initiatives, as it allows for innovative practices that support foundational literacy and numeracy.

Literature Review

A considerable body of research highlights the evolving nature of digital competence among teachers and learners across educational contexts. **Jain & Shetty (2022)** [7] revealed that gender does not significantly influence digital competence among school teachers, indicating that both male and female teachers possess relatively high proficiency in digital skills. Similarly, **Protolo & Solikhati (2021)** [13] obtained that teachers demonstrated positive attitudes toward digital literacy in EFL classrooms, actively using digital devices to access information, design effective teaching strategies, and enhance students' language skills. However, disparities emerge when contextual factors such as residence and socioeconomic background are considered. **Zhao et al. (2021)** [20] found that significant differences in digital competence among students based on their residential background, with urban students reporting stronger competencies than rural students in multiple domains, including information literacy, collaboration, safety, and problem-solving. During the COVID-19 pandemic period, **Zalat et al. (2021)** [19] noted that widespread acceptance of e-learning among university faculty, with a majority acknowledging its usefulness and ease of use. Nevertheless, technological barriers such as poor internet connectivity, inadequate infrastructure, and lack of devices emerged as major constraints, alongside demographic variations where younger and male faculty showed higher acceptance levels. At the teacher education level, **Mahalik (2020)** [11] illustrated a mixed scenario in Odisha: while most teacher trainees were comfortable with basic digital operations and commonly used applications, many lacked advanced skills related to cybersecurity, web content creation, and learning management systems. **Sharma & Lata (2019)** [14] reported that there was inadequate awareness among medical faculty and students regarding advanced information retrieval techniques, despite moderate

familiarity with digital resources. Findings from **Mahadik (2019)** [10] further suggested that digital literacy initiatives in academic institutions positively influence awareness and usage of ICT tools when structured training is provided. Research among students also indicates generally positive engagement with digital and library resources. Studies such as **Surendran (2018)** [15] and **Chanchinmawia & Verma (2018)** [3] documented encouraging levels of information literacy and internet use, though access inequalities persist. At the school level, digital literacy among teachers remains uneven. **Kumari & D'Souza (2016)** [8] reported average levels of digital literacy among secondary school teachers, with a strong positive relationship between digital competence and ICT integration in pedagogy. Finally, **Far (2013)** [5] conducted a study on university teachers' attitude towards information and communication technology use concerning computer competence and anxiety revealed that higher digital competence is strongly associated with more positive attitudes toward ICT, underscoring competence as a key determinant of technology adoption. The reviewed literature indicates progressive digital competency across contexts but highlights persistent disparities linked to geography, infrastructure, economic background, and exposure to technology. While attitudes toward digital integration are largely positive, structural barriers, unequal access, and skill gaps remain critical challenges that must be addressed through targeted policies, capacity-building initiatives, and inclusive digital education strategies.

Rationale of the Study

The advent of digital transformation in education has brought about a paradigm shift, particularly in the context of the NEP-2020, which emphasizes the integration of technology to enhance teaching and learning. NEP-2020 envisions a digitally empowered education ecosystem, emphasizing Continuous Professional Development (CPD) for teachers, foundational learning through Early Childhood Care and Education (ECCE), and inclusive practices for Children with Special Needs (CWSN). Initiatives like DIKSHA (Digital Infrastructure for Knowledge Sharing) headed by Central Institute of Educational Technology (CIET) a constituent unit of National Council of Educational Research and Training (NCERT) offer innovative digital resources to foster competency among elementary teachers. District Institute of Education and Training (DIET) plays pivotal in realizing these objectives by equipping elementary grade teachers with essential digital competencies. This analytical study focuses on evaluating the digital skills of elementary teachers in Mayurbhanj district, considering these national priorities and tools, to identify gaps and propose actionable solutions. As Mayurbhanj district, located in the state of Odisha, India, is an area where educational reforms are underway to enhance learning experiences through technology. Understanding the current level of digital competencies among elementary teachers is essential for informing targeted professional development programs, optimizing resource allocation, and ultimately improving student outcomes. In the context of Mayurbhanj district, one of Odisha's most prominent tribal areas, the integration of digital competencies poses unique challenges and opportunities in the field of school education. The district's socio-economic conditions, digital infrastructure, and cultural diversity significantly impact teachers' access to and use of digital tools in classrooms. Despite these challenges, efforts are being made by state govt. to introduce digital resources in elementary education, aiming to bridge the digital divide and improve learning outcomes. This study aimed to evaluate the digital competencies of elementary grade teachers in Mayurbhanj district through a comprehensive analytical approach by assessing various dimensions of digital proficiency, ranging from basic computer skills to advanced educational technology applications. This research lined up to provide a comprehensive understanding of teachers' capabilities and identify areas where further support and training were needed. This study addressed the following questions:

- ✓ *What were the current level of digital competencies among elementary grade teachers in Mayurbhanj district?*
- ✓ *How did these competencies align with the demands of modern educational practices?*
- ✓ *What specific areas require enhancement to better support teachers in integrating technology into their classrooms?*

The findings of this study which evaluates the digital competency skills of elementary grade teachers in Mayurbhanj district to be valuable for a wide range of stakeholders, including scholars, teachers, students, researchers, and the education system. By assessing the current level of digital competencies among teachers in this region, the study focused to provide insights into the strengths and gaps in digital skills, which inform future educational strategies and policies. Scholars accustomed these findings to deepen research on digital literacy in education, while teachers benefited from the recommendations to enhance their own digital skills for better teaching outcomes Further, students asserted indirectly as more digitally competent teachers create more engaging and effective learning environments. Additionally, the findings guided educational authorities and researchers in designing professional development programs that cater specifically to the needs of teachers, ultimately contributing to the improvement of digital competence within the education system of the district and beyond.

Objectives of the Study

The objectives of the research work are:

1. To study the digital competencies of male and female elementary grade teachers of Mayurbhanj district.
2. To compare the digital competencies of urban and rural elementary grade teachers of Mayurbhanj district.
3. To analyze the digital competencies of elementary grade teachers with reference to their income status in Mayurbhanj district.

Hypotheses of the Study

The hypotheses of the research work are:

1. There is no significant difference between the digital competencies of male and female elementary grade teachers of Mayurbhanj district.
2. There is no significant difference between the digital competencies of urban and rural elementary grade teachers of Mayurbhanj district.
3. There is no significant difference in digital competencies of elementary grade teachers with

reference to their economic status in Mayurbhanj district.

Delimitation of the Study

The population of the study delimited to elementary grade teachers only (teaching in Class I to VIII). The study is delimited to 120 elementary grade school teachers as sample. The study is confined to elementary grade teachers of Mayurbhanj district only. The study is delimited to variables like gender, location and economic status (HES & LES) only.

Methodology

Taking into consideration the nature of study the investigator adopted the descriptive survey research design to evaluate the digital competencies of elementary grade teachers in Mayurbhanj district of Odisha. In the present study, the population constituted out of elementary grade teachers of Mayurbhanj district of Odisha, India. For the collection of samples for the study, stratified and simple random technique was used. In this study, digital competencies are considered as dependent variable and gender, locality, income and teaching experiences are considered as independent variables. For the present study a total number of 120 elementary grade school teachers were selected as sample by aforementioned sampling technique. The following table depicts the details of sample for the study.

(Table 1: Description of the sample of the study)

Variables (Gender)	Locality		Income		Total
	Urban	Rural	High Economic Status (HES)	Low Economic Status (LES)	
Male	30	30	30	30	60
Female	30	30	30	30	60
Total	**60**	**60**	**60**	**60**	**120**

Tools and Techniques

Tools and techniques are key components of research work as they play significant role in collection, analysis and interpretation of data. In the present study, the researcher used Digital Competency Rating Scale (DCRS) to collect the data from the elementary grade school teachers of the Mayurbhanj district. The tool comprised of 5 domains as Technology Proficiency, Digital Pedagogy, Digital Ethics and Security, Collaboration and Communication and Professional Development and Innovation. For the purpose of data collection; a 5-point scale i.e. Digital Competency Rating Scale (DCRS) indicating the degree of strength of perception of individual such as No Competency (Not Applicable), Beginner (Basic Awareness), Intermediate (Some Proficiency), Advanced (Good Proficiency) and Expert (Highly Skilled). Reliability of the scale is calculated by Test-Retest Method. and found to be 0.78 which is reliable. The content of the tool was reviewed by experts from the District Institute of Education and Training (DIET) Mayurbhanj, Govt. ETEI, Baripada and field practitioners to ensure alignment with the objectives of NEP-2020 and contemporary digital pedagogical practices. A small feedback session post-administration revealed that 90% of the participants found the statements easy to comprehend.

Analysis and Interpretation

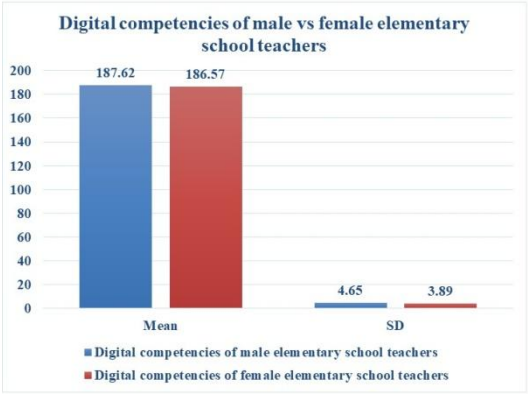
(Table 2: Digital competencies of male vs female elementary grade school teachers of Mayurbhanj district)

Sl. No	Variables	N	Mean	SD	SED	t-ratio	Level of Significance
1	Digital competencies of male elementary school teachers	60	187.62	4.65	0.78	1.34	Not Significant at both level i.e. 0.01 & 0.05 level
2	Digital competencies of female elementary school teachers	60	186.57	3.89			

(Degree of freedom = 118, at 0.05 level = 1.98, at 0.01 level = 2.63)

It is shown from above table that the mean score for digital competencies of male and female elementary teachers is 187.62 and 186.57, with standard deviations of 4.65 and 3.89, respectively. The calculated t-value of 1.34 is less than the critical values at both the 0.05 level (1.98) and the 0.01 level (2.63) with a degree of freedom (dof)=118. This indicates no statistically significant difference between the digital competencies of male and female elementary teachers which concludes that the digital competencies of male and female teachers are comparable.

Graphical Representation: Digital competencies of male and female elementary school teachers of Mayurbhanj district is depicted in the above table and represented by the following bar diagram.



(Fig. 2: Digital competencies of male vs female elementary grade school teachers of Mayurbhanj district)

(Table 3: Digital competencies of urban vs rural elementary grade school teachers of Mayurbhanj district)

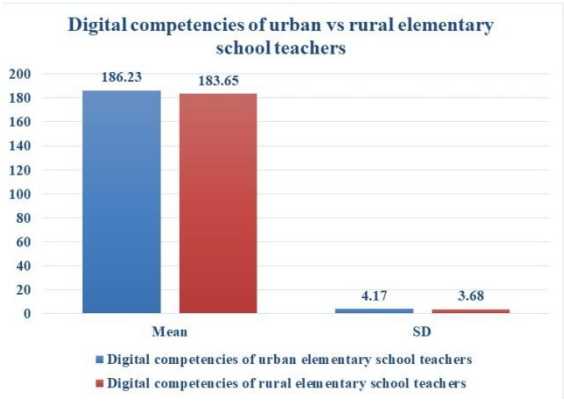
Sl. N							Level of Significa

o	Variables	N	Mean	SD	SE D	t-ratio	nce
1	Digital competencies of urban elementary school teachers	60	186.23	4.17	0.71	3.63	Significant at both level i.e. 0.01 & 0.05 level
2	Digital competencies of rural elementary school teachers	60	183.65	3.68			

(Degree of freedom = 118, at 0.05 level = 1.98, at 0.01 level = 2.63)

It is observed from above table that the mean score for digital competencies of urban and rural elementary teachers is 186.23 and 183.65, with standard deviations of 4.17 and 3.68, respectively. The calculated t-value of 3.63 is greater than the critical values at both the 0.05 level (1.98) and the 0.01 level (2.63) with a degree of freedom (dof) = 118. This indicates a statistically significant difference between the digital competencies of urban and rural elementary grade teachers. The urban teachers' higher mean score suggests they exhibit better digital competencies compared to their rural counterparts.

Graphical Representation: Digital competencies of rural and urban elementary grade school teachers of Mayurbhanj district is depicted in the above table and represented by the following bar diagram.



(Fig. 3: Digital competencies of urban vs rural elementary grade school teachers of Mayurbhanj district)

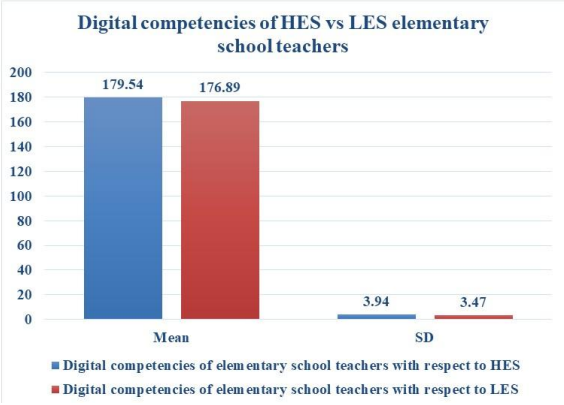
[Table 4: Digital competencies of elementary grade teachers with High Economic Status (HES) and Low Economic Status (LES) in Mayurbhanj district]

Sl. No	Variables	N	Mean	SD	SE D	t-ratio	Level of Significance
1	Digital competencies of elementary school teachers with respect to HES	60	179.54	3.94	0.68	3.89	Significant at both level i.e. 0.01 & 0.05 level
2	Digital competencies of elementary school teachers with respect to LES	60	176.89	3.47			

(Degree of freedom = 118, at 0.05 level = 1.98, at 0.01 level = 2.63)

It is shown from above table that the mean score for digital competencies of elementary school teachers with High Economic Status (HES) and Low Economic Status (LES) are 179.54 and 176.89, with standard deviations of 3.94 and 3.47, respectively. The calculated t-value of 3.89 is greater than the critical values at both the 0.05 level (1.98) and the 0.01 level (2.63) with a degree of freedom (dof)=118. This indicates a statistically significant difference between the digital competencies of teachers with HES and LES which indicates that the teachers with HES possess better digital competencies compared to those with LES.

Graphical Representation: Digital competencies of elementary grade teachers with reference to their economic status in Mayurbhanj district is depicted in the above table and represented by the following bar diagram.



[Fig. 4: Digital competencies of High Economic Status (HES) vs Low Economic Status (LES) elementary grade teachers with in Mayurbhanj district]

Findings and Educational Implications

Every study provides some meaningful information and knowledge to the related field and this study also has some systematic, organized and meaningful information. There is no statistically significant difference between the digital competencies of male and female elementary teachers of Mayurbhanj district which concludes that the digital competencies of male and female teachers are comparable. Male and female elementary grade school teachers in Mayurbhanj district exhibit similar levels of digital competency. There exists a statistically significant difference between the digital competencies of urban and rural elementary grade teachers of Mayurbhanj district which concludes urban elementary grade school teachers exhibit better digital competencies compared to their rural counterparts. There exists a statistically significant difference between the digital competencies of teachers

with HES and LES in Mayurbhanj district which indicates the teachers with HES possess better digital competencies compared to those with LES.

There are several educational implications of the study such as:

1. The findings are relevance for stakeholders such as schools, teachers, students, parents and community members, as they highlight the current status and practical needs related to digital competency in elementary education.
2. The study will assist teachers in making the teaching learning process more effective by adoption of updated digital tools, innovative pedagogical strategies and technology integrated teaching methods.
3. The study will support coordinators, administrators and academic supervisors in planning and organizing a greater number of technologies, focused professional development and capacity-building training programmes for teachers.
4. The study is beneficial for policymakers to review, redesign and strengthen existing policies related to digital education, ensuring improved quality and inclusiveness in the teaching learning system at the elementary level.
5. The study contributes towards enhancing the quality of education by promoting digital literacy, strengthening instructional practices.

Recommendations

The recommendations of the research work are:

1. It is suggested that the alike type of research work may be conducted for secondary and higher secondary level school teachers in the Mayurbhanj district or other districts.
2. It is suggested that research work can be conducted on how teaching experience affects digital competency, whether novice teachers are adept with digital tools than others.
3. The present study is confined to the Mayurbhanj district only. Therefore, a similar study can be conducted on other districts/tribal districts like Kalahandi, Balangir & Koraput.
4. It is suggested that study can be undertaken to linking teachers' digital competencies to student academic performance and digital literacy.

Conclusion

Based on the results of research work it was concluded that there is no statistically significant difference between the digital competencies of male and female elementary teachers of Mayurbhanj district. Gender does not play a significant role in determining the digital competency of elementary teachers in Mayurbhanj district. There is a statistically significant difference in digital competencies between urban and rural teachers, with urban teachers demonstrating superior competency levels in Mayurbhanj district. Economic status significantly influences digital competency, highlighting the need for interventions to reduce disparities between teachers from HES and LES in Mayurbhanj district. The results indicate an equitable distribution of training opportunities and access to digital resources for both male and female teachers, reflecting the efforts of local and national education authorities to promote gender equity in digital education. However, urban teachers demonstrate higher levels of digital proficiency due to better physical infrastructure and greater exposure to technology, whereas rural teachers lag behind. Therefore, more emphasis should be placed on supporting rural teachers by improving infrastructure, providing digital devices, and increasing opportunities for meaningful engagement with ICT tools. Similarly, teachers with Lower Economic Status (LES) exhibit lower levels of digital competency compared to those with Higher Economic Status (HES). To reduce this gap, LES teachers must be given enhanced access to technology, more training opportunities, and financial assistance that can encourage technology adoption and foster their digital skill development.

References

Anyaoku, E.N., Ezeani, C.N., & Osuigwe, N.E., (2015). Information literacy practices of librarians in universities in South East Nigeria. *International Journal of Library and Information Science*, 7(5), 96-102.

Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, L.A., & Otto, A., (2022). Teachers' digital competencies in higher education: a systematic literature review. *International Journal of Educational Technology in Higher Education*, 19(1), 1-16.

Chanchinmawia, F., & Verma, M.K., (2018). Assessment of information literacy skills among research scholars of Mizoram University: A study. *Assessment*, *8*(1), 389-399.

Erol, H., (2021). A Review of Social Studies Course Books Regarding Digital Literacy and Media Literacy. *International* Journal *of Higher Education*. 10(5), 213-219.

Far, N.Z., (2013). University teachers' attitude towards information and communication technology use in relation to computer competence and anxiety. (Published doctoral thesis). Punjab University: Department of education. Retrieved from https://jter.in/index.php/JTER/article/download/31/30/.

Hadagali, G.S., Kumbar, B.D., & Talawar, A., (2013). Use of Internet by the post-graduate students of six state universities of Karnataka: A study. *International Journal of Library Science*. 9(3), 13-22.

Jain, V., & Shetty, S.A., (2022). Digital competence among teachers across gender, *Turkish Online Journal of Qualitative* Inquiry. 13(1), 1083-1089.

Kumari, S. V., & D'Souza, F., (2016). Secondary school teachers' digital literacy and use of ICT in teaching and learning. *International Journal of Computational Research and Development*, 1(1), 141-146.

Mabayoje, M.A., Isah, A., Bajeh, A.O., & Oyekunle, R.A., (2016). An assessment of ICT literacy among secondary school students in a rural area of Kwara State, Nigeria: A community advocacy approach. *Covenant Journal of Informatics and Communication Technology*, *3*(1). 38-43.

Mahadik, P.A., (2019). A study on Digital literacy among users in law institute libraries in Pune: A Study. (Published doctoral thesis). Tilak Maharashtra Vidyapeeth: Department of library and information science. Retrieved from http://hdl.handle.net/10603/286557.

Mahalik, R., (2020). Digital literacy and its use by teacher trainee at secondary level in Odisha. *Trends in Technical &* Scientific *Research,* 4(2), 30-36.

Nachiappan, N., (2017). Information and computer literacy skills among research scholars of Alagappa University Karaikudi Tamil Nadu a case study. (Published doctoral thesis), Alagappa University: Department of library and information science. Retrieved from http://hdl.handle.net/10603/136113.

Pratolo, W.B., & Solikhati, A.H., (2021). Investigating teachers' attitude towards digital literacy in EFL classroom. *Journal of Education and Learning*.1(5), 97-103.

Sharma, S., & Lata, S., (2019). Information Literacy among Faculty and Students of Medical Colleges of Haryana, Punjab and Chandigarh. *International Journal of Educational and Pedagogical Sciences*, 13(6), 816-820.

Surendran, B., (2018). Information literacy skills among senior secondary school students of Kendriya Vidyalayas in Kerala: A Study. (Published doctoral thesis). Alagappa University: Department of library and information science. Retrieved from http://hdl.handle.net/10603/288853.

Sz, S.T., Saleem & Batch, M.S., (2014). Digital literacy awareness among Arts and Science college students in Tiruvallur district: A study. *International Journal of Managerial Studies and Research*, *2*(4), 61-67.

Vasimalairaja, M., & Prakash. J.M., & Kumar, P.G., (2020). Awareness of secondary school teacher education students in relation to information and communication technology. *Paideuma Journal,* 1(2), 10-16.

Velmani, P., (2018). A study of technology literacy among the school teachers in Sriperumbudur Taluk. (Published doctoral thesis), Manonmaniam Sundaranar University: Department of Education. Retrieved from http://hdl.handle.net/10603/23829939.

Zalat, M.M., Hamed, M.S., & Bolbol, S.A., (2021). The experiences, challenges, and acceptance of e-learning as a tool for teaching during the COVID-19 pandemic among university medical staff. *PLoS One*, 16(3), 248-258.

Zhao, Y., Sánchez Gómez, M. C., Pinto Llorente, A. M., & Zhao, L. (2021). Digital Competence in Higher Education: Students' Perception and Personal Factors. *Sustainability*, 13(21), 12-18.