
**DIGITAL COMPETENCY AND ATTITUDE OF IN-SERVICE TEACHERS
TOWARDS EDUCATIONAL MEDIA IN RELATION TO CERTAIN
DEMOGRAPHIC VARIABLES**

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ABSTRACT

This empirical study makes an attempt to explore the relationship between secondary school in-service teachers' attitude towards educational media and their digital competency, and compares them on the bases of gender (Male vs. Female) and types of schools (Government vs. Private). The sample comprised of 110 in-service teachers from secondary schools of Nalgonda district

selected through simple random sampling technique. By applying an ex-post-facto research methodology, this study uses two types of tools: 'Digital Competence Assessment Questionnaire' developed by Shrivastava and Dangwal; and a self-constructed five-point Likert scale, named 'Scale for Attitude towards Educational Media' comprising 56 items, and responses based on five-levels of agreement. The findings revealed that a positive and moderate correlation was found between in-service teachers' attitudes toward educational media with their digital competencies; no significant differences were found in the attitudes and digital competencies on the bases of gender and types of institutions.

KEYWORDS: *Digital Competency, Attitude Towards Educational Media, Secondary Schoolin-Service Teachers, Gender, Institution Types.*

INTRODUCTION

Nowadays, the usage of internet is considered as the elite lifestyle (Van Deursen & Van Dijk, 2014). In order to survive in the ever enhancing digital technology, teachers must have possessed a high level of digital competency. An important milestone in contemporary pedagogy is the integration of digital media into the education, which offers dynamic resources to enhance student learning. For navigating digital media efficiently and effectively digital literacy and digital competency are the pre-requisite along with the positive attitude towards the educational media.

According to Tiede (2020) Digital competency is often used interchangeably with digital literacy, media literacy and media competency. Digital competency is a broader term which includes digital literacy. It is the 'integrated and functional use of digital knowledge, skills and attitudes (Aesaert et al., 2013). It refers to the skills and knowledge that teachers possess to use digital tools effectively in their professional roles. According to the European Commission (2023), digital competency includes skills in information and communication technology (ICT), the ability to manage digital tools, and the capacity to integrate technology into teaching and learning. It encompasses a wide range of skills, from the ability of using digital tools for teaching and learning, to understanding and applying the ethical implications of digital media. It includes online communication, and navigating digital resources responsibly. According to McGarr and McDonagh (2019) digital competence for teachers has four dimensions Pedagogical, Ethical, Attitudinal, and Technical. In this way, digital competence is a multifaceted concept that comprises a combination of technical, cognitive, and digital skills, along with metacognitive processes. It also includes social, emotional, and ethical awareness regarding the usage and comprehension of digital technologies. This competence involves the confident, critical, and innovative application of diverse digital tools to access, store, retrieve, create, share, and evaluate information. Further, it enables to communicate effectively, solve the problems, and think critically and creatively in every sphere of life. The modes and media of communication are reasonably important for the effective transmission of knowledge because they enable students to engage into a variety of ways in the process of learning. Moreover, educational media considerably improves communication by facilitating faster access to content and enhancing the ability to retain information. It is affected by exposure, resources, and access to technology. However, in-service teachers' attitude towards educational media influences their adoption and use of digital technologies in their practice.

In the rapidly evolving scenario of education, educational media has become a basic tool in enhancing engagement, learning experiences, and students' achievement. As the integration of digital technologies into education continues to reshape teaching and learning environments, secondary school in-service teachers are also increasingly required to adapt to new digital tools and platforms. The success of such integration, however, is often influenced by teachers' attitudes towards educational media and their digital competencies. These factors play a key role in effective utilization of technology by the in-service teachers to achieve instructional objectives and empower students, especially in diverse classrooms.

Significance of the Study

Today, almost all activities of our daily life are performed with the help of internet which is the only base for utilizing the various types of digital gadgets that are used in social interactions, commercial transactions, medical, educational purposes, and many more. The integration of digital tools and media into education has become vital in the present educational setting. The attitudes of in-service teachers towards educational media can play a significant role in effective utilization of digital technologies in the classroom and more importantly possessing digital literacy and thereby digital competencies. With the quick development of technology, digital competency has emerged as an essential 21st century skill for in-service teachers to facilitate learning, manage classrooms, and engage students effectively. While much research has been conducted on the impact of digital media on student learning achievement, less attention has been paid to understand how in-service teachers' attitudes towards educational media and their digital competencies relate each other and affected by the demographic variables.

The present study aims to explore the relationship between secondary school in-service teachers' attitudes toward educational media and their digital competency, with a specific attention on how these variables vary across gender and institution types. The research considers the male and female in-service teachers of marginalized communities from government and private secondary schools, to understand how their digital competence and attitude towards educational media varies. Secondary school in-service teachers from marginalized communities may face challenges in accessing digital tools and resources, which may impact both their attitudes and digital competencies.

In the light of the above discussion, this study contributes to the current discourse on the importance of enhancing digital literacy in educational context and offers insights to improve in-service teachers' digital competencies. Understanding the interplay between their attitude towards educational media and their abilities to use them will help in planning future training programs, professional development strategies, and policies aimed at enhancing the integration of educational media in classrooms, especially in diverse educational environments. This research is important in the context of global effort towards digital equity in education, where equal access to digital tools and resources can bridge the digital divide and ensure that all students, irrespective of their diversity, benefit from high-quality learning experiences. Also, it is helpful in finding out the influence of certain demographic factors- such as gender and institution types- on attitudes of in-service teachers towards educational media, and their digital competencies which can help in shaping prospective digital technology initiatives and enhancing professional development of in-service teachers.

In-service teachers' attitude towards educational media considerably affects the ability to use educational media and thereby teaching effectiveness. It keeps the student engaged in teaching

learning process. Positive attitude helps in adoption of new technology in the classroom. In-service teachers' attitude towards educational media is the key for their willingness to use them in their teaching. Teachers who opine digital tools as beneficial for enhancing learning outcomes are more likely to use them in their pedagogical practices. However, negative attitude act as a barrier to integrate technology into education. Teachers' beliefs and attitudes towards educational media influence its uses. Teachers who have doubts about the effectiveness of digital tools and face barriers such as lack of training and resources, may show unwillingness of using them, thus hinders their potential in the classroom.

In-service teachers' digital competency is associated with their application of educational media. Along with the pedagogical mastery, digital literacy and skills is crucial for modern teachers to use digital media effectively. Digital competency and digital skills are become a basic requirement in most of the educational systems across the world, but at the same time there is a wide digital divide. According to the report of the OECD (2018) "many teachers still lack sufficient digital competency, which could limit their ability to integrate educational media in meaningful ways". Furthermore, the digital divide—variations in access to technology and training—has been found to be contributing factor to disparities in teachers' digital skills (Van Deursen & Van Dijk, 2014).

Despite its significance, the relationship between in-service teachers' digital competency and their attitude toward educational media is less attentive, particularly in the context of secondary education. These are further influenced by demographic factors such as gender, locality, experience and institutional characteristics. Research suggests that gender disparity influences digital competency levels and the adoption of technology in teaching. Further, in-service teachers' use of educational media is influenced by the type of institution, which determines access to digital resources and change for professional development. Hence, the researchers identified the 'digital competency and attitude of in-service teachers towards educational media' as research area.

Objectives of the study:

The objectives of the study are as follows:

1. To study the levels of Digital Competency of Secondary School In-service Teachers.
2. To study the levels of attitude of Secondary School In-service Teachers towards Educational Media.
3. To find out the correlation between Digital Competency and attitude towards Educational Media of Secondary School In-service Teachers.
4. To compare the Digital Competency of Male and Female Secondary School In-service Teachers.
5. To compare the attitude towards Educational Media of Male and Female Secondary School In-service Teachers.
6. To compare the Digital Competency of Government and Private Secondary School In-service Teachers.
7. To compare the attitude towards Educational Media of Government and Private Secondary School In-service Teachers.

Hypotheses of the study:

For achieving the objectives 1 and 2, frequency and percentage used; whereas for objectives from 3 to 7 null hypotheses were formulated which are as under:

1. There will be no significant correlation between Digital Competency and attitude towards Educational Media of Secondary School In-service Teachers. (for objective 3rd)
2. There will be no significant difference between the Digital Competency of Male and Female Secondary School In-service Teachers. (for objective 4th)
3. There will be no significant difference between the attitude towards Educational Media of Male and Female Secondary School In-service Teachers. (for objective 5th)
4. There will be no significant difference between the Digital Competency of Government and Private Secondary School In-service Teachers. (for objective 6th)
5. There will be no significant difference between the attitude towards Educational Media of Government and Private Secondary School In-service Teachers. (for objective 7th)

Literature Review

The growing interest to explore the demographic variables that influence in-service teachers' attitudes and digital competencies has prompted the researchers to carry out this study. Regardless of the increasing importance of digital tools in education, the attitudes of secondary school in-service teachers towards the educational media are still neglected, especially when various demographic factors such as gender and institution types are considered. Only one such type of study has been found which was conducted by Kumar & Sharma (2024) on digital competency of secondary school teachers with demographic variables like gender, locality and type of institutions. Some noteworthy researches conducted in the related field are discussed below:

Omodara & Adu (2014) aimed to assess the importance of educational media and multimedia technology for effective implementation in teaching and learning process. The finding reveals that educational media and technology are inevitable in teaching-learning process.

Van Deursen & Van Dijk (2014) conducted a survey on Dutch population and tried to explore Internet use among them. They delimited the internet usage into seven dimensions e.g. "information, news, personal development, commercial transaction, leisure, social interaction, and gaming". People who have been using the Internet for long time used internet for news, information, music and video. Also, age, gender and education were the significant predictors for the differences in the internet usage. Also, persons having low levels of education were found to be more engaged in internet usage than medium and high levels of education. Peoples of low levels of education are engaged more in time consuming activities such as, social interaction and gaming. Differences in internet usage on the bases of age and gender were found to be temporal.

Spiteri & Rundgren (2018) conducted a research on "Literature Review on the Factors Affecting Primary Teachers' Use of Digital Technology" and found that components such as teachers' competence, attitudes, and skills, together with the institutional culture, can profoundly influence their implementation of digital technology in educational settings.

Fernández-Batanero et al. (2020) conducted a systematic and Literature reviews on digital competencies for teachers' professional development from 2008 to 2018. The aim of the study was to identify research trends & potential direction on this topic for future research. The methods used to PRISMA guideline systematic reviews and Meta-Analysis. The sample consisted 21 studies in Scopus and Web of Science databases. The result shows that teacher facing challenges in digital competence due to lack of teacher training and ICT training.

Guillén-Gómez et al. (2021) examined the comparative study of gender on the digital competence of higher education teachers, indicating that there was no significant overall difference, but disparities found in specific areas, such as digital skills, digital ethics, and ICT anxiety.

Srivastava & Dangwal (2021) reported that higher education teachers had a moderate level of digital competency; only 8.44% of them had higher level of digital competency. They possessed moderate level of digital competency in "the dimensions of technological/operational/instrumental, information processing and management, pedagogic/ knowledge construction, and digital citizenship".

Jain & Shetty (2022) carry out a study aiming to investigate the digital competency among school teachers. A sample of 64 school teachers (including 32 female and 32 male) selected through purposive sampling technique from English and Kannada medium schools within 'Belthangady Taluka'. The finding shows that there was no significant difference in the digital competency between female and male teachers.

Khan & Cheema, (2022) explored digital competency among teachers in Pakistani schools. They stressed the importance of training and support to improve teachers' digital skills and use of technology in the lessons.

Pera et al. (2022) revealed that teachers of high schools and higher education demonstrated varying levels of digital competency, with teaching experience influencing their ICT knowledge and skills.

Babu & Suneela (2023) revealed that 83% of teachers showed medium and high level of digital competency. Significant differences based on gender and locality, were reported. While teaching subject and age showed non-significant influence on digital competency.

Kumar & Sharma (2024) explored the relationship of digital competency gender, locality and school types. The sample consists of 500 secondary school teachers. The data was collected through Digital competency scale by Shipra Shrivastava & Kiran Lata Dangal. The results shows that there is significant difference between male and female teachers with former having higher digital competency. There is also significant difference between rural and urban teachers with later having higher digital competence. Also, there was a significant difference reported between teachers of private and government secondary schools with later having higher digital competencies.

Gender differences in technology use and digital competency have been a topic of considerable interest. It is quite evident that, in most of the cases, male teachers often have more favourable attitudes toward technology and higher digital skills than their female counterparts. However, this difference cannot be generalized and conclusive because in other educational context female can demonstrate equal or greater proficiency in using digital tools when adequate training and resources are provided to them. Further, the type of educational institutions also influences

teachers' attitudes towards educational media and digital competency. Teachers in private schools often have access to better resources and opportunities, including professional development programs and technological infrastructure, which enhances their digital skills. Government schools' teachers, on the other hand, face scarcity of basic infrastructure due to financial constraints, limited access to technology, and less opportunity for professional development. All these hinder their enhancement of digital competencies. So, professional development programs should be customized in view of focusing digital competency of the teachers.

Methodology

The present research employed an ex-post-facto design, which involves analysing existing relationships between variables without manipulating them. A sample of 110 secondary school in-service teachers from government and private schools across Nalgonda district drawn through simple random sampling technique. The data was collected through two types of tools: a questionnaire designed to assess teachers' digital competency named 'Digital Competence Assessment Questionnaire' developed by Shrivastava & Dangwal (2021) and a self-constructed five-point Likert scale designed to assess in-service teachers' attitudes toward educational media named 'Scale for Attitude towards Educational Media' comprising 56 items, and based on five-levels of agreement. Out of 110 samples, 43 were male and 67 female, and 45 from government schools and 65 from private schools. The gender-wise and school-wise two-dimensional distribution of the sample is given below in table A:

Table: A. Gender-Wise and School-Wise Distribution of the Sample

		School Types		
		Government	Private	Total
Gender	Female	38	29	67
	Male	7	36	43
Total		45	65	110

Descriptive statistics, Pearson co-efficient of correlation, and independent sample t-test was used to examine the relationship between in-service teachers' attitudes toward educational media and their digital competency, and to explore any significant differences across gender and types of institution.

Results and Discussion

The objective-wise output of analysed data and its interpretation is discussed in this section.

The first objective of the study was "To study the levels of Digital Competency of Secondary School In-service Teachers". To accomplish this objective, researchers calculated the range of scores by subtracting minimum score from maximum score and divided the range into three categories with their respective scores, then calculated the frequencies in respective categories. The output are presented in the following table 1

Table 1: ‘Levels of Digital Competency of Secondary School In-service Teachers’

S. No.	Levels of DC	Range	N	%
1	Low DC	35 and Below	5	4.5
2	Average DC	36-48	35	31.8
3	High DC	49 and Above	70	63.6
Total			110	100

From the above table 1, it is evident that only 5 out of 110, i.e. 4.5% of the secondary school in-service teachers possess low level of digital competency, whereas 31.8% of them possess moderate level of digital competency and 63.6% of them have high level of digital competency. This means a majority of them have a higher level of digital competency which is the necessity of the hour. Similar findings have been reported by the study of Babu & Suneela (2023) indicating 83% of in-service teachers possessed moderate and high level of digital competency. But, the study of Srivastava & Dangwal (2021) revealed that most of higher education teachers had moderate level of digital competency and few of them had higher level of digital competency. This shows that situation is changing rapidly. This might be because of ever developing technology that pushed up the teachers to keep updated with. Also, the finding of Pera et al. (2022) reflected that teachers from high schools and higher education differ in the levels of digital competencies. This might be because of increasing needs of adapting at higher education level.

The second objective of the study was “To study the levels of attitude of Secondary School Teacher towards Educational Media”. To achieve this objective, researchers calculated the range of scores obtained from the tool by subtracting minimum score from maximum score and divided the range into three categories with their respective scores, thereafter ascertained the frequencies in respective categories. The results are presented in the following table 2

Table 2: Levels of attitude of Secondary School In-service Teachers towards Educational Media

S. No.	Levels of Attitude towards EM	Range	N	%
1	Negative Attitude towards EM	184 and Below	22	20.0
2	Neutral Attitude towards EM	From 185 to 229	61	55.5
3	Positive Attitude towards EM	230 and Above	27	24.5
Total			110	100

Table 2, shows that 22 out of 110, i.e. 20% of the secondary school in-service teachers had a negative attitude towards educational media, whereas most of them i.e. 55.5% possess neutral attitude towards educational media and almost one-fourth of them i.e. 24.5% of them had a positive attitude towards educational media. This might be of undesirable outcomes of the media, challenges in using them, age constraints and lack of resources that restricts the in-service teachers to use them.

The study had the third objective as “To find out the correlation between Digital Competency and attitude towards Educational Media of Secondary School In-service Teachers”. And the concerned H0 of this objective was “there will be no significant relationship between Digital Competency and attitude towards Educational Media of Secondary School In-service Teachers”. To test this H0, researchers applied Pearson correlation method and output shown in following table 3

Table: 3 Correlation between Digital Competency and attitude towards Educational Media of Secondary School In-service Teachers N=110

Variable pairs	R	Sig. (p)
Digital Competency and attitude towards Educational Media	0.417**	.000
**. 'Correlation is significant at the 0.01 level (2-tailed).'		

It is evident by the table 3rd that value of ‘Pearson Correlation’ (r) between digital competency and attitude towards educational media is 0.417 that is significant on .01 level. Therefore, ‘Null Hypothesis’ (H₀) that, “there will be no significant relationship between Digital Competency and attitude towards Educational Media of Secondary School In-service Teachers” is rejected. Further, the value of r is positive and is of moderate level. This implies that the two variables are associated positively and increase of one variable caused the increase in other. It also means that, if we develop a positive attitude towards educational media among in-service teachers, then we can enhance the digital competency among them and vice versa. Hence, it may be concluded that there is a positive correlation between secondary school in-service teachers’ attitude towards educational media and their digital competency. This result is obvious because a favourable attitude is pre-requisite for digital competency.

The study has fourth objective as “To compare the Digital Competency of Male and Female Secondary School In-service Teachers”. And the concerned H₀ of this objective was “there will be no significant difference between the Digital Competency of Male and Female Secondary School In-service Teachers”. To test this H₀, researcher employed ‘t-test’ and output is given in the table 4

Table 4: ‘Comparison of Mean Scores of Digital Competency of Female and Male Secondary School In-service Teachers’

Gender	N	Mean	S D	df	t-value	p-value/ remarks
Female	67	48.85	7.05	108	-.772	0.442 (N.S.)
Male	43	49.93	7.32			
N.S.= ‘Not Significant at 0.05 level’						

It is clear with table 4, that value of t is -.772 that is non-significant on .05 level. Hence, the H₀ “there will be no significant difference between the Digital Competency of Male and Female Secondary School In-service Teachers” is not rejected. It means there is no significance difference between Digital Competency of female and male in-service teachers of Secondary Schools. It may be inferred that gender does not influence Digital Competency of in-service teachers significantly. Similar findings have been stated by Guillén-Gámez et al. (2021); and Jain & Shetty (2022) wherein non-significant differences in the digital competency of female and male teachers were reported. It shows the universal requirement of digital competency. But, Kumar & Sharma (2024) reported significant differences in digital competencies of male and female teachers with male having superiority. This might be of male teachers getting the advantage of having more exposure to new technologies.

The study has fifth objective as “To compare the attitude towards Educational Media of Male and Female Secondary School In-service Teachers”. And the concerned H₀ of this objective was “there will be no significant difference between the attitude towards Educational Media of Male

and Female Secondary School In-service Teachers”. To test this H₀, researchers uses ‘t-test’ and output is given in the table 5 below:

Table 5: ‘Comparison of Mean Scores of attitude towards Educational Media of Female and Male Secondary School In-service Teachers’

Gender	N	Mean	S D	df	t-value	p-value/ remarks
Female	67	205.40	30.45	108	-.809	0.421 (N.S.)
Male	43	209.93	25.59			
N.S.= ‘Not Significant at 0.05 level’						

It is clear by table 5, that value of t is -.809 that is non-significant on .05 level. Hence, the H₀ “there will be no significant difference between the attitude towards Educational Media of Male and Female Secondary School In-service Teachers” is not rejected. It means the difference is non-significant between secondary school male and female in-service teachers’ attitude towards Educational Media. Also, it may be inferred that gender does not influence the attitude of secondary school in-service teachers towards Educational Media. This indicates that both male and female in-service teachers are equally benefitted by the educational media.

The study has sixth objective as “To compare the Digital Competency of Government and Private Secondary School In-service Teachers”. And the concerned H₀ of this objective was “there will be no significant difference between the Digital Competency of Government and Private Secondary School In-service Teachers”. In order to test this H₀, researcher employed ‘t-test’ and output is given in the following table 6.

Table 6: ‘Comparison of Mean Scores of Digital Competency of Government and Private Secondary School In-service Teachers’

School Type	N	Mean	S D	df	t-value	p-value/ remarks
Government School	45	47.89	7.44	108	-1.71	0.091 (N.S.)
Private School	65	50.23	6.83			
N.S.= ‘Not Significant at 0.05 level’						

It becomes clear by table 6, that value of t is -1.71 that is non-significant on .05 level. Hence, the H₀ “there will be no significant difference between the Digital Competency of Government and Private Secondary School In-service Teachers” is not rejected. It means there is non-significant influence of school types on Digital Competency of Secondary School In-service Teachers. Hence, it can be concluded that Government and Private secondary school in-service teachers do not differ significantly in their Digital Competency. But, Kumar & Sharma (2024) reported a significant difference in digital competency of Government and Private school teachers with later has superiority. This might be of teachers from Private schools get the advantage of having more infrastructures; thereby getting more opportunity to apply technologies.

The study has seventh objective as “To compare the attitude towards Educational Media of Government and Private Secondary School In-service Teachers”. And the concerned H₀ of this objective was “there will be no significant difference between the attitude towards Educational Media of Government and Private Secondary School In-service Teachers”. To test this H₀, researcher used ‘t-test’ and output is shown in table 7 below:

Table 7: ‘Comparison of Mean Scores of attitude towards Educational Media of Government and Private Secondary School In-service Teachers’

School Type	N	Mean	S D	df	t-value	p-value/ remarks
Government School	45	203.71	26.66	108	-1.056	0.293 (N.S.)
Private School	65	209.57	29.85			
N.S.= Not Significant at 0.05 level						

Table 7 exhibits that value of t is -1.056 that is non-significant on .05 level. Hence, the H0 “there will be no significant difference between the attitude towards Educational Media of Government and Private Secondary School In-service Teachers” is not rejected. It means school types do not influence secondary school in-service teachers’ attitude towards Educational Media significantly. Therefore, it can be inferred that attitude of secondary school in-service teachers towards educational media are same across the school types. The probable cause is that teachers of both types of schools enjoy similar kind of experiences, advantages, and challenges.

Findings

This study emphasizes the needs for developing favorable attitude towards educational media so that digital competencies can be enhanced among in-service teachers of marginalized communities of India. The key findings of research are:

1. A majority of the secondary school teacher has high level of digital competency.
2. Most of secondary school in-service teachers possess neutral attitude towards educational media.
3. A positive correlation was found between secondary school in-service teachers’ digital competency and their attitude towards educational media.
4. Female and male in-service teachers of secondary schools do not differ in their Digital Competency.
5. Female and male teacher does not differ in attitude towards Educational Media.
6. School type does not cause variation in Digital Competency of secondary school in-service teachers.
7. School type does not cause variation in the attitude of secondary schools in-service teachers towards Educational Media.

CONCLUSION

‘Digital competency is a complex set of knowledge, skills and attitudes’ (McGarr & McDonagh, 2019). It also includes digital literacy. Digital literacy and a positive attitude towards educational media is the key to digital competency. The significance of digital skills and competency is increasing day by day (Bond et al., 2018). A digitally competent teacher can satisfy the needs of the 21st century learner and make his/ her teaching effective; engage the learner in teaching learning process actively; motivate them to learn effectively; thereby enhance the achievement of learner. A teacher of 21st century must have good digital literacy competencies (Atmazaki, & Indriyani, 2019) and enhance them as per the need of the hour (Manfra & Holmes, 2020). Outcomes of the study highlight the need and significance of developing the positive attitude towards educational media and digital literacy. In-service teachers’ attitude towards

educational media is positively related to their digital competency, suggesting that developing a positive attitude towards digital technology can improve teachers' digital skills and competencies. Additionally, the study highlighted the equal need of professional development programs across the gender, and school types to develop the positive attitude towards digital education and to enhance their digital literacy. The study has implications for teachers, administrators and policymakers. Future research may focus on experimental researches to identify the effect of specific professional development interventions through specific digital media on teachers' attitudes, their digital competency, and their performance over time.

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