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Usage of ICT in relation to self-efficacy among secondary school teachers

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Abstract
One of the most striking features of ICTs is their ability to transcend time and space. With the gradual rise of internet, a profusion of learning resources on virtually any topic and in a variety of mediums may now be accessed by an infinite number of individuals from anywhere and at any time of the day. This is especially important for many secondary schools in underdeveloped nations, where library resources are scarce and obsolete. The present study was undertaken to explore the Usage of ICT in relation to Self-Efficacy among secondary school teachers. The investigator collected data from 76 teachers of private and 45 teachers teaching in government secondary schools of Varanasi. Two sets of questionnaires consisting of usage of ICT and self-efficacy based on the Five-point Likert Scale were used to collect data from the secondary school teachers in Varanasi. Percentage analysis was used to explore the levels of self-efficacy and ICT usage among secondary school teachers. Furthermore, product-moment correlation and t-test were employed to find out the relationship and significant differences between ICT usage and self-efficacy between private and government secondary school teachers of Varanasi city. The findings of the study revealed that the majority of secondary school teachers came under the category of average level of ICT usage and Self-Efficacy. The study also revealed that there was a significant relationship between high and average levels of ICT usage and the self-efficacy of secondary school teachers. The study also revealed that there was a significant difference in the ICT usage and self-efficacy of government and private secondary school teachers.

Keywords: Usage of ICT, self- efficacy and secondary school teachers

1. Introductions
ICT is described as a "diverse range of technical tools and resources used to communicate and produce, transmit, store, and manage information." Computers, the Internet, broadcasting technologies (radio and television), and the smartphones are examples of this technology. There has been a rise of interest in recent years in how computers and the Internet may be utilised to improve the efficiency and effectiveness of education at all levels and in both formal and informal settings. ICT promotes both synchronous and asynchronous learning. In asynchronous learning or teaching there is a time lag between the transmission of instruction by the teacher and its reception by the students. ICT-based educational delivery (for example, instructional information delivered via radio or television) reduces the need for all students and teachers to be present in the same physical location. Furthermore, many forms of ICTs, such as video conferencing, enable numerous, geographically distant learners to receive instruction at the same time (i.e., synchronous learning).
Radio and television, for example, have been utilized for open and remote learning for over four decades even though print remains the cheapest, most accessible, and hence most dominant delivery method in both developed and developing nations. Computers and the Internet are still in their infancy in underdeveloped countries due to inadequate infrastructure and high connection prices. ICT in education even promotes inclusion in the classroom by allowing students with special needs to utilize ICT tools appropriately according to their requirements. ICT in education provides students and instructors with a new avenue for learning. ICT promotes student and teacher cooperation; it naturally brings students and instructors together to discuss issues relevant to their work and encourages language development (Valentin, Tablas, Perez, Lopez, and Garcia, 2013) [17]. ICT teaches the same subject in numerous ways, therefore it makes learning more pleasurable. ICT in education assists instructors in developing their skills, knowledge, and understanding by allowing them to exchange and evaluate information obtained from many sources and in various ways

(Archibong, Ogbiji, and Idem, 2010) [1]. ICT's purpose in education is to improve students' understanding and assist instructors in developing their Technological Pedagogical and Content Knowledge (TPACK) so that they may incorporate it into their classroom instruction (Andyani, Setyosari, Wiyono, and Djatmika, 2020) [2].

Hammond *et al*. (2011) [11] investigated why instructors used ICT and observed a link between lower levels of ICT self-efficacy and less frequent use of ICT. Furthermore, a recent study has discovered an association between self-efficacy in utilizing digital tools and ICT usage in the classroom (Teo, 2014; Hatlevik, 2016) [16, 12]. Furthermore, there is a link between the usage of computers by student instructors and their computer self-efficacy. Today's fast-paced world is increasingly defined by technology-driven communication, which has converted it, into a vast worldwide linked community with ever-increasing information and communication technology outreach. ICT refers to a set of technologies that are used in the collection, storage, editing, retrieval, and transmission of data in various formats (Olakulehin, 2007) [14].

The value of technology in people's lives is enormous, and digital literacy is expected to become a practical prerequisite for people's job, social, and even personal lives. Students will require ICT competencies to function well in a knowledge-based society for both social and economic reasons. The first and finest essential sector for ICT applications is education. ICT is frequently viewed as a catalyst for change, including changes in teaching techniques, learning methodologies, and information availability (Watson, 2005). ICTs can aid by giving alternate educational options (Casal, 2007). Students' use of various ICT tools has become unavoidable in their studies.

Students can quickly access needed knowledge by utilizing information and communication technology. They may use current technologies such as wireless networks, the Internet, search engines, databases, websites, and web 2.0 technologies to access and share electronic content such as e-books and e-journals and improve their learning. Teachers are a critical link in the educational chain. For education to be able to honestly respond to the needs of the twenty-first century, it must play a key role in leveraging technology, particularly in the use of new information and Communication Technology (ICT) devices in teaching and learning. ICT refers to all of the technology that allows us to detect, analyse, and share information. ICT is a plural word that refers to a wide range of technologies. To summarise, information and communication technology (ICT) is a broad phrase that encompasses the entire range of electronic instruments that humans use to acquire, record, and store data, as well as share and disseminate data to others (Anderson, 2010) [19].

1.1 ICT Competencies of Teachers

Teachers are the most important link in ensuring that ICT is used effectively in educational settings and that ICT is integrated into the curriculum. They are essential participants in every endeavour aimed at enhancing the teaching and learning process. There are no longer any lecture methods or other traditional methods to be utilised in the classroom; instead, teachers must decide how to employ ICT in the classroom for instructional purposes. As a result, a teacher's role is crucial; if instructors aren't actively interested in incorporating ICT into all phases of the curriculum, then ICT will have little impact on teaching the curriculum in schools. Teachers should come prepared in the class with various internet resources related to the topics, and only then the students can be motivated and inspired to use ICT in completing their term papers and assignments. Keeping in view the teachers need of incorporating technology into the curriculum, they are increasingly searching the internet for materials to supplement their theme activities. Teachers are improving in their roles as facilitators, assisting students in remaining engaged in their quest of knowledge. Today's teachers are creating more relevant tasks and involving pupils in issues that they are passionate about. They are inspiring pupils by utilising computers and telecommunications in such a way that they can engage the students in more fruitful activities resulting in achieving better learning outcome among students.

Teachers serve as a conduit between students and technology and a driving factor in the development of an ICT-literate society. Teachers must prepare and update the information on topics utilizing the ICT resources available to schools as educators. When ICT is used in teaching and learning, it may make a subject more engaging for all students, and it can also help teachers to gain experience and knowledge while interacting with students. The degree of expertise and understanding of ICT skills among instructors varies, given the variety and breadth of digital technologies available. Some instructors are fast to pick up new information and technological abilities, while others are still learning technology basics, including email, student file management systems, the Internet, and office productivity tools.

1.2 Self-efficacy

Self-efficacy refers to a person's ability to have a significant impact. Self-efficacy is the belief in one's ability to succeed in a particular scenario. Higher self-efficacy equates to more perseverance. People generate and develop self-perceptions of ability that are beneficial to the goals they pursue and the influence they can exert over the environment. These beliefs impact individuals' motivation and performance; persons with high efficacy attribute failure to effort, while those with poor self-efficacy ascribe failure to ability. Self-regulatory mechanisms allow people to control their behaviour (Bandura, 1977) [6]. Self-observation, self-evaluation, and self-reaction are examples of these mechanisms. The self-concept, self-esteem and values are part of the self-evaluation process. People are more likely to connect in tasks where they feel capable and safe.

It is critical to assess the relationship between self-efficacy, result expectation and competence. The degree to which people feel their actions will result in a specific consequence is result anticipation. An efficacy expectation is a degree to which they believe they can achieve a particular goal. There is a difference between thinking that something can happen and believing that one can cause it to happen (Bandura, 1997) [6]. Self-efficacy is a more powerful determinant of an individual's decision than specific skills and knowledge relevant to the problematic behaviour. Although the information and skills, as well as the outcomes people have learned and expected, may serve as a precursor to and creator of their self-efficacy philosophy, the filtering effect of the created belief ultimately screens, redefines, distorts, or reshapes the outcomes of subsequent labours to create a new self-efficacy philosophy (Pajares, 2002) [15]. or reshapes

the outcomes of subsequent labours to create a new self-efficacy philosophy (Pajares, 2002) [15].

1.3 Significance of study
The teachers will have to develop ICT competencies that will help them to understand and apply the changes in the new teaching-learning process. ICT usage includes using ICT tools for finding information and communicating with others. On the other hand, self-efficacy includes solving problems and creatively using life experiences and talent for an effective and appropriate result. The reality is that education has changed, and as per the directions of NEP 2020, ICT based learning will now be an integral part of secondary education. Our teachers will have to improve their ICT competencies so as to uplift the quality of education provided in secondary schools, that are the foundation years of the young minds and budding teachers, doctors' and scientists of our country. Hence the researcher has chosen the present study for investigation.

1.4 Statement of the problem
The study is entitled as Usage of ICT in Relation to Self-Efficacy among Secondary School Teachers.

1.5 Operational definitions
ICT usage: In this study, ICT usage refers to the capacity to manage and arrange the use of digital technologies in the teaching and learning process and the core understanding of digital learning. Teachers' expertise and technical training on handling and maintaining ICT equipment and software are linked to ICT usage

Self-Efficacy: Self-efficacy refers to an individual's belief in their capacity to execute behaviours necessary to produce specific performance attainments.

1.6 Objectives
- To explore the usage levels of ICT among secondary school teachers.
- To explore the levels of self-efficacy of secondary school teachers.
- To find out the relationship between high levels of ICT usage with self-efficacy among secondary school teachers.
- To find out the relationship between average levels of ICT usage with self-efficacy among secondary school teachers.
- To find out the relationship between low levels of ICT usage with self-efficacy among secondary school teachers.
- To compare the differences between the ICT usage of government and private secondary school teachers.
- To compare the differences between the self-efficacy of government and private secondary school teachers.

1.7 Hypotheses
- The majority of secondary school teachers will show average levels of ICT usage.
- The majority of secondary school teachers will show average levels of self-efficacy.
- There exists no significant relationship between high levels of ICT usage and the self-efficacy of secondary school teachers.
- There exists no significant relationship between average levels of ICT usage and self-efficacy among secondary school teachers.
- There exists no significant relationship between low levels of ICT usage and self-efficacy among secondary school teachers.
- There exist no significant differences in ICT usage of government and private secondary school teachers.
- There exist no significant differences in the self-efficacy of government and private secondary school teachers.

2. Methodology
2.1 Research Design
The current study comes under descriptive research, where the survey method was taken to collect the data.

2.2 Sample Size
The sample of the present study was selected using the purposive sampling technique. The researcher collected data from 76 teachers in private and 45 teachers in government secondary schools of Varanasi as seen in table given below

Sl. No.	Schools	No. of teachers
1	Government secondary schools	45
2	Private secondary schools	75
	Total	120

2.3 Tools for Data Collection
Two sets of questionnaires based on the Five-point Likert Scale were used to collect data from teachers. The first questionnaire on the usage of ICT consisted of 20 items on two dimensions' technical evaluation and technological ICT usage. The second questionnaire on Self-efficacy consisted of 20 items on three dimensions of instructional process, learning process, attitude with classroom management.

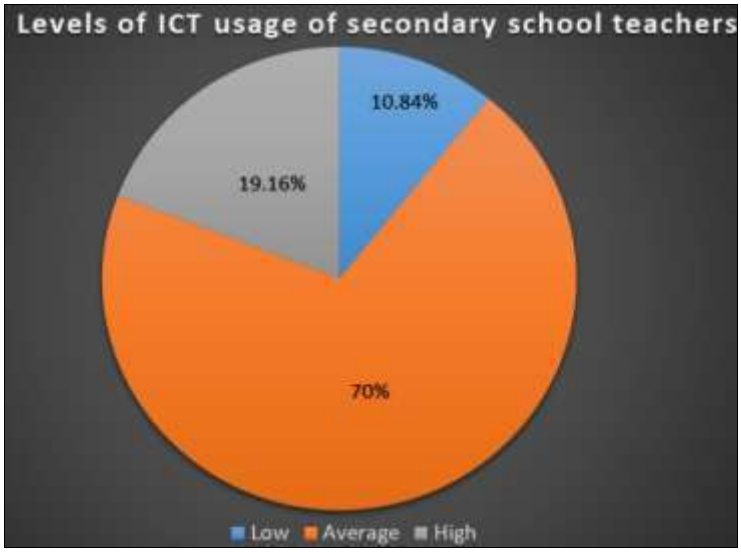
2.4 Techniques of Analysis and Interpretation
Percentage analysis was used to explore the levels of self-efficacy and ICT usage among secondary school teachers. Further, product-moment correlation and t-test were used to find out the relationship and significant differences between ICT usage and self-efficacy between private and government secondary school teachers of Varanasi city.

3. Analysis of data
The percentage analysis technique was used to explore the levels of ICT usage among secondary school teachers. The observed value is presented in table 1.

H_1: Majority of secondary school teachers will show average levels of ICT usage
The level of ICT usage was found using percentage analysis, and the result is presented in table 1 and the pie-chart 1.

Table 1: showing levels of ICT usage among secondary school teachers of Varanasi.

S.N.	Level	N	% of Teachers
1	High	23	10.84
2	Average	84	70.0
3	Low	13	19.16
	Total	120	100



Pie-Chart 1: showing the levels of ICT usage of secondary school teachers.

Interpretation

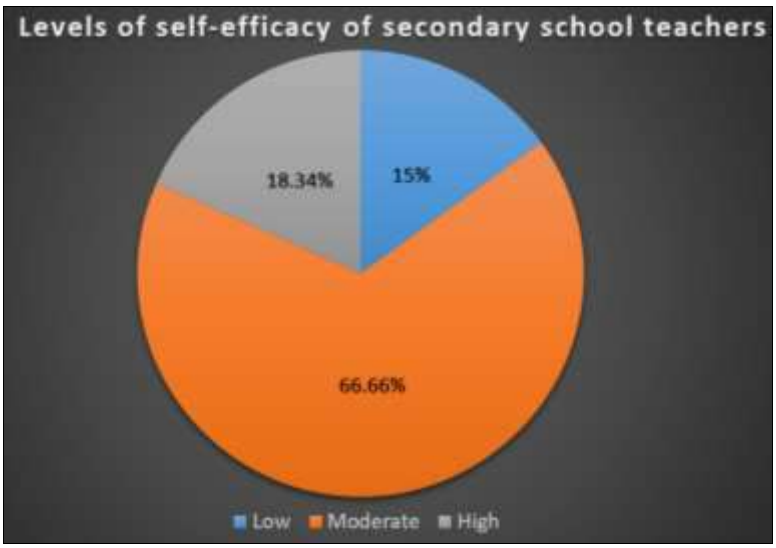
Table 1 and pie-chart 1 showed that 10.84% of secondary school teachers had high levels of ICT usage, while 19.16% of teachers had a low level of ICT usage, and the remaining 70% of teachers had an average level of ICT usage. Hence it was analyzed from the above table that most of the secondary school teachers came under the category of the average level of ICT usage. Therefore, the hypothesis was accepted.

H_2: The majority of secondary school teachers will show average levels of self-efficacy

The levels of Self-Efficacy were found using percentage analysis, and the result is presented in table 2 and Pie-Chart 2.

Table 2: showing levels of self-efficacy of secondary school teachers

S.N.	Level	N	% of Teachers
1	High	22	15.0
2	Average	80	66.66
3	Low	13	18.34
	Total	120	100



Pie-Chart 2: showing the levels of Self-Efficacy of secondary school teachers

Interpretation

Table 2 and pie-chart 2 showed that 15% of secondary school teachers had a high level of self-efficacy. In comparison, 18.34% of teachers had a low level of self-efficacy, and the remaining 66.66% of teachers had an average level of self-efficacy. Hence, it was analyzed from the above that most of the secondary school teachers came under the average level of self-efficacy. Therefore, the hypothesis was accepted.

H_3: There exists no significant relationship between high levels of ICT usage and self-efficacy of secondary school teachers.

Table 3: showing relationship between high levels of ICT usage and the self-efficacy of secondary school teachers.

Variables	No. of secondary school teacher (N)	Mean	Std. Deviation	r	Df	Remark
ICT Usage	23	93.91	4.17	0.467*	44	significant at 0.05 level
Self-Efficacy	23	76.39	4.53			

Interpretation
Table 3 depicts that the calculated (Pearson Product Moment Coefficient Correlation) value of r was 0.467 at the df (Degree of Freedom) 44 which was greater than the critical value of r, i.e., 0.28 at a 0.05 level of confidence. Therefore, the null hypothesis was rejected. Hence, there exists a significant positive relationship between the High-levels of ICT Usage and the self-efficacy of secondary school teachers.

H_4: There exists no significant relationship between average levels of ICT usage and self-efficacy among secondary school teachers.

Table 4: showing relationship between average levels of ICT usage and the self-efficacy of secondary school teachers.

Variables	Total No Of secondary school teacher (N)	Mean	Std. Deviation	r	Df	Remark
ICT Usage	84	75.40	5.69	0.26	82	Significant at 0.05 level
Self-Efficacy	84	72.90	6.28			

Interpretation
Table 4 depicts that the calculated (Person Product Moment Coefficient Correlation) value of r is 0.26 at the df (Degree of Freedom) 82 which was found greater than the r critical value i.e., 0.217 at a 0.05 level of confidence. The H_0 was rejected by the investigator. Hence, a significant positive relationship was found between the average-level of ICT Usage and self-efficacy among secondary school teachers.

H_5: There exists no significant relationship between low levels of ICT usage and self-efficacy among secondary school teachers.

Table 5: showing relationship between low levels of ICT usage and the self-efficacy of secondary school teachers.

Variables	Total No Of secondary school teacher (N)	Mean	Std. Deviation	r	DF	Remark
ICT Usage	13	57.08	7.34	0.021	24	Not Significant at 0.05 level
Self-Efficacy	13	70.38	7.24			

Interpretation
Table 5 depicts that the calculated (Person Product Moment Coefficient Correlation) value of r i.e. 0.021 at the df (Degree of Freedom) 24 which was found less than the critical value of r i.e., 0.388 at a 0.05 level of confidence. The H_0 was accepted by the Investigator. Hence, no significant relationship was found between low level of ICT Usage and self-efficacy among secondary school teachers.

H_6: There exist no significant differences in ICT usage of government and private secondary school teachers.
The null hypothesis has been tested using t-test, the result of which is presented in table 6**.**

Table 6: showing differences between government teachers and private teachers of secondary school regarding the usage of ICT.

ICT Usages	Number of teachers	Mean	SD	DF	t-value	Remark
Government school	45	72.51	11.88	118	3.44	Significant
Private school	75	79.64	10.41			

Interpretation
Table 6 depicts the mean score of Government and Private secondary school teachers as 72.51 and 79.64 respectively. The Standard Deviation of Government and Private secondary school teachers were found to be 11.88 and 10.41 respectively. The calculated t- value was 3.44 which was found to be greater than the table value of t at 0.05 level of significance i.e. 1.98 with df 118. Therefore, the null hypothesis was rejected by investigator. Hence there was significant difference between government and private secondary school teachers related to ICT usage.
H_7: There exist no significant differences in the self-efficacy of government and private secondary school teachers.

Table 7: showing the differences between self-efficacy of government and private teachers of secondary schools.

Self-Efficacy	Number of teachers	Mean	SD	Table Value	DF	t-value	Remark
Government school	45	71.18	6.08	1.984	118	2.95	Significant
Private school	75	74.57	6.09				

Interpretation
Table 7 depicts the mean scores of Government and Private secondary school teachers as 71.18 and 74.57 respectively. The Standard Deviation of Government and Private secondary school teachers was found to be 6.08 and 6.09 respectively. The calculated t- value was 2.95 which was found to be greater than the table t-value at 0.05 level of significance i.e. 1.98 with df 118. Therefore, the null hypothesis was rejected by investigator. Hence it was inferred that there was significant differences between self-Efficacy of government and private secondary school teachers.

4. Findings

- It was found that the majority of secondary school teachers came under the category of an average level of ICT usage.
- The study revealed that the majority of secondary school teachers came under the category of average level of Self-Efficacy.
- The study also revealed that there was a significant relationship between high levels of ICT usage and the self-efficacy of secondary school teachers.
- It was revealed that there was a significant relationship between average levels of ICT usage and the self-efficacy of secondary school teachers.
- It was revealed that there was no significant relationship between low levels of ICT usage and the self-efficacy of secondary school teachers.
- The study also revealed that there was a significant difference in the ICT usage of government and private secondary school teachers.
- The study also revealed that there was a significant difference in the Self-Efficacy of government and private secondary school teachers

Limitations

The study was limited only to the teachers of secondary schools of Varanasi city.

5. References

1. Archibong I, Ogbiji J. ICT Competence among Academic Staff in Universities in Cross Rivers State, Nigeria. Computer and Information Science. 2010;3(4):109-115.
2. Andyani H, Setyosari P, Wiyono BB, Djatmika ET. Does technological pedagogical content knowledge impact the use of ICT in pedagogy? International Journal of Emerging Technologies in Learning. 2020;15(3):126-139. https://doi.org/10.3991/ijet.v15i03.11690.
3. Abbitt JT. An Investigation of the Relationship between Self-Efficacy Beliefs about Technology Integration and Technological Pedagogical Content Knowledge (TPACK) among Pre-service Teachers. Journal of Digital Learning in Teacher Education. 2011;27(4):34-143.
4. Alhassan R. Exploring the Relationship between Web 2.0 Tools Self-Efficacy and Teachers' Use of These Tools in Their Teaching. Journal of Education and Learning. 2017;6(4):217.
5. Aslan A, Zhu C. Investigating variables predicting Turkish pre-service teachers' integration of ICT into teaching practices. British Journal of Educational Technology. 2016;48(2):552-570.
6. Bandura A. Self-Efficacy: The Exercise of Control. New York, NY: W.H. Freeman; c1997.
7. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review. 1977;84(2):191-215.
8. Barak M. Instructional principles for fostering learning with ICT: teachers' perspectives as learners and instructors. Education and Information Technologies. 2006;11(2):121-135.
9. Casal RC. ICT for Education and Development. Info. 2007, 9(4).
10. Giles RM, Kent AM. An Investigation of Preservice Teachers' Self-Efficacy for Teaching with Technology. Asian Education Studies. 2016;1(1):32.
11. Hammond M, Reynolds L, Ingram J. How and why do student teachers use ICT? J. Comput. Assist. Learn. 2011;27:191-203.
12. Hatlevik OE. Examining the Relationship between Teachers' Self-Efficacy, their Digital Competence, Strategies to Evaluate Information, and use of ICT at School. Scandinavian Journal of Educational Research. 2016;61(5):555-567.
13. Li S, Yamaguchi S, Sukhbaatar J, Takada JI. The Influence of Teachers' Professional Development Activities on the Factors Promoting ICT Integration in Primary Schools in Mongolia. Education Sciences. 20199(2):78. https://doi.org/10.3390/educsci9020078
14. Olakulehin Felix Kayode. Information and Communication Technologies in Teacher Training and Professional Development in Nigeria. Turkish Online Journal of Distance Education-TOJDE. 2007;8(1):133-142.
15. Pajares F. Gender and Perceived Self-Efficacy in Self-Regulated Learning. Theory into Practice. 2002;41:116-225.
16. Teo T. Unpacking teachers' acceptance of technology: tests of measurement invariance and latent mean differences. Comput. Educ. 2014;75:127-135.
17. Valentín A, Mateos PM, González-Tablas MM, Pérez L, López E, García I. Motivation and learning strategies in the use of ICTs among university students. Computers & Education. 2013;61:52-58.
18. Skaalvik EM, Skaalvik S. Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. Journal of Educational Psychology. 2007;99(3):611-625. https://doi.org/10.1037/0022-0663.99.3.611.
19. Anderson C. Presenting and evaluating qualitative research. American journal of pharmaceutical education. 2010 Oct 1;74(8).