Anusandhanvallari
Vol 2024, No.1
July 2024
ISSN 2229-3388

Predictive Role of ICT Literacy in determining Academic Achievement among High School Teachers

***Nisha T Mohammed, **Dr. K. Vellaichamy**
[1]Research Scholar, Department of Education, Madurai Kamaraj University, Madurai-625 021
[2]Assistant Professor, Department of Education, Madurai Kamaraj University, Madurai-625 021.

Abstract

This study investigates the relationship between Information and Communication Technology (ICT) literacy and academic achievement among high school teachers in Madurai District, Tamil Nadu. The integration of ICT in education is seen as essential in preparing students for the evolving demands of the 21st century. The research specifically examines the ICT literacy levels of teachers and their academic achievement considering variables such as gender, age, and marital status. A sample of 300 high school teachers was selected using a stratified random approach, and data were collected through an ICT literacy scale and general information sheet. The study aims to assess the overall ICT literacy levels, evaluate the impact of demographic factors on ICT literacy and academic achievement and explore the correlation between ICT literacy and teachers' academic performance. The findings indicate that ICT literacy is generally high among the teachers, with female and married teachers showing significantly higher ICT literacy levels. The study also found that while gender and marital status significantly influenced both ICT literacy and academic achievement, age did not have a significant impact on either. Academic achievement among teachers was also found to be above average, with male teachers performing better than female teachers in this regard. Additionally, a significant positive relationship was found between ICT literacy and academic achievement, suggesting that higher ICT proficiency is associated with better academic performance. This study underscores the importance of ICT literacy in enhancing teachers' academic achievements and highlights the need for targeted professional development initiatives that consider gender and marital status. The implications of these findings stress the importance of integrating ICT training into teacher education programs for improving overall educational quality.

Keywords: ICT Literacy, Academic Achievement and High School Teachers

Introduction

The end of the 20th century marked a period of significant change, particularly in the realm of Information and Communication Technology (ICT). It is crucial for those involved in education to recognize that, in today's rapidly evolving world, students must be equipped to adapt intelligently to the social, economic, and technological shifts occurring around them. The educational landscape is undergoing rapid transformation due to ICT, and this evolution is expected to continue.

ICT encompasses a range of electronic and computerized tools, along with the interactive materials that facilitate their use for various teaching, learning, and personal purposes. Around the globe, educational systems face increasing pressure to integrate ICT into their curricula to help students acquire the knowledge and skills necessary for success in the 21st century. With the emergence of new technologies, the teaching profession is shifting from traditional teacher-centered, lecture-based models to more dynamic, interactive learning environments (Vandana Mehra and Dilli Raj Newa, 2009). In this context, proficiency in ICT and its application in teaching and learning has become an essential skill for today's educators.

A teacher's attitude plays a significant role in the successful integration of new technologies into

educational settings, and the teacher remains a central figure in this process. Computers are revolutionizing all sectors of society, and with the rapid growth of knowledge and increasing intellectual curiosity, the demand for data storage, analysis, decision-making, and presentation has become a defining characteristic of modern life. From scientists and technologists to everyday users, people across the world are engaging with machines via local area networks (LANs), wide area networks (WANs), and the internet, which enable access to and dissemination of information.

The rise of network technologies has been fueled by the economic advantages of interconnected computers, along with the advances in cable and satellite transmission systems. Today, computers are often linked locally, forming LANs. Over the past fifteen years, computers have sparked significant changes, with people of all ages— from preschoolers to senior citizens— using computers to support intellectual growth, including tasks like managing personal data. While the pace of progress in countries like India may be slower due to economic constraints, the widespread presence of computers in classrooms and libraries is evident.

Need for the Study

Literacy encompasses confidence, competence, and acceptance. Students entering college bring a wide range of computer skills and attitudes toward technology. While some students are eager to engage with new technologies, others may be hesitant. According to Oliver and Towers (2000), ICT literacy refers to a student's ability to effectively use information and communication technologies for educational purposes.

Internet literacy goes beyond simply analyzing websites. It involves the skills necessary to read, evaluate, and share online information, as well as to network and collaborate with others. Katz and Macklin (2007) identified seven key components of ICT literacy: defining, accessing, managing, integrating, evaluating, creating, and communicating information. Ali et al. (2010) emphasized the importance of improving students' information literacy skills, such as employing efficient search strategies, critically assessing online information and websites, and using information ethically. With the current generation of students having access to vast amounts of information online, these skills are more crucial than ever.

Information and Communication Technologies (ICTs)—which include traditional media like radio and television, as well as newer digital technologies like computers and the internet—are seen as powerful tools for educational transformation. When used effectively, ICTs can expand access to education, make learning more relevant to the digital job market, and enhance educational quality by creating engaging, real-world connections in teaching and learning. However, the experience of integrating ICTs into education globally over the past several decades shows that realizing their full potential is not automatic. The successful integration of ICTs in education is a complex, multifaceted process that goes beyond technology acquisition (which, with sufficient funding, is the easier part). It also requires thoughtful consideration of curriculum, pedagogy, institutional readiness, teacher training, and long-term financing.

This primer aims to assist policymakers in developing countries by outlining a framework for the appropriate and effective use of ICTs in education. It first provides an overview of the potential benefits of ICTs in education and reviews how these technologies have been used in various educational contexts. Next, it discusses four key issues in the use of ICTs in education: effectiveness, cost, equity, and sustainability. The primer concludes by addressing five major challenges that policymakers in developing countries must consider when integrating ICTs into education: educational policy and planning, infrastructure, capacity building, language and content, and financing.

In the classroom, students use computers to work on science projects, prepare reports, and gather information from digital sources around the world. A motivated student can dive deeply into the vast ocean of knowledge, exploring beyond the limits of what a teacher can provide due to human constraints. Schools are

among the environments that stand to benefit the most from multimedia, which can bring about significant changes in the teaching process. Multimedia combines text, graphics, sound, animation, and video, creating a dynamic and engaging learning experience. However, to serve the needs of various users, multimedia requires substantial digital storage. For intelligent students, multimedia offers a more advanced approach to learning compared to traditional methods. In this context, the teacher becomes more of a guide and mentor, while the students take center stage in the learning process, actively engaging in creative and personalized learning.

Terms and Definitions

ICT Literacy : refers to the teachers learn about the technology enhanced classrooms that foster opportunities for teaching and learning by integrating learning technology, such as computers, specialized software, audience response technology, assistive listening devices, networking, and audio/visual capabilities.

Academic achievement: refers to the IX and X standard students got scores from half-yearly examination that is rounded into 100.

High School teachers: refers to those who are working in high schools in Madurai District.

Dependent Variables: ICT Literacy and Academic Achievement

Independent Variables: Gender, Age and Marital Status

Objectives of the Study

Following are the specific objectives framed for the study:

1. To assess the level of ICT literacy among high school teachers.
2. To examine the significant impact of independent variables such as Gender, Age, and Marital Status on ICT literacy among high school teachers.
3. To evaluate the level of academic achievement among high school teachers.
4. To investigate the significant effect of independent variables such as Gender, Age, and Marital Status on academic achievement among high school teachers.
5. To explore the relationship between ICT literacy and academic achievement among high school teachers.

Hypotheses of the Study

The following hypotheses are formulated in the present study:

1. ICT literacy among the high school teachers is above the average level.
2. Gender exerts a significant influence on ICT literacy among the high school teachers.
3. Age exerts a significant influence on ICT literacy among the high school teachers.
4. Marital status exerts a significant influence on ICT literacy among the high school teachers.
5. Academic achievement among the high school teachers is above the average level.
6. Gender exerts a significant influence on Academic achievement among the high school teachers.
7. Age exerts a significant influence on Academic achievement among the high school teachers.
8. Marital status exerts a significant influence on Academic achievement among the high school teachers.
9. There is a significant and positive relationship between ICT literacy and Academic achievement among the high school teachers.

Sample of the Study

A stratified representative sample of 300 high school teachers constituted from schools recognized by the Department of School Education, Tamil Nadu situated in Madurai District with due representation given to the variables viz., Gender, Age and Marital status.

Tools used

The following tools were used by the investigator for the data collection:

1. General Information Sheet developed by the Investigator.
2. ICT literacy scale developed by Raji,V.(2014).

Statistical Treatments:

The statistical treatments employed in the study are listed below:

i. 't'- test for significance of difference between the means of large independent samples.
ii. Correlation Analysis – Pearson's Product Moment Correlation-'r'.

Data Analysis

Hypothesis 1: ICT literacy among the high school teachers is above average.

The average score of the ICT literacy among the high school teachers is found to be 36, while the theoretical average is 38. This shows that the ICT literacy among the high school teachers is above the average level. **Hence the hypothesis is accepted.**

Hypothesis 2: Gender exerts a significant influence on ICT literacy among the high school teachers.

Table 1: Statistical measures and results of test of significance of difference between the means score of ICT literacy among the high school teachers: Gender-Wise

Variable	Sub-category	N	M	S.D.	' t'- value	Significance at 0.05 level
Gender	Male	161	40.02	6.83	-2.040	Significant
	Female	189	38.05	7.68		

It is evident from table 1, that the obtained 't' value -2.040 is higher than the table value 1.96 at 0.05 level of significance. This shows that there is a significant difference between the male and female teachers in terms of ICT literacy among the high school teachers. Further, it is observed that female teachers have possessed more ICT literacy than male teachers. **Hence the hypothesis is accepted.**

Hypothesis 3: Age exerts a significant influence on ICT literacy among the high school teachers.

Table.2: Statistical measures and results of test of significance of difference between the means score of ICT literacy among the high school teachers: Age-Wise

Variable	Sub-category	N	M	S.D.	' t'- value	Significance at 0.05 level
Age	Upto 30 years	182	38.43	7.29	1.642	Not Significant
	31& above years	168	36.62	8.35		

It is evident from table 2, that the obtained 't' value 1.642 is lower than the table value 1.96 at 0.05 level of significance. This shows that there is no significant difference between the upto 30 years and 31 and above years of age teachers in terms of ICT literacy among the high school teachers. Further, it is observed that Age does not influence on ICT literacy among the teachers. **Hence the hypothesis is rejected.**

Hypothesis 4: Marital status exerts a significant influence on ICT literacy among the high school teachers.

Table 3: Statistical measures and results of test of significance of difference between the means score of ICT literacy among the high school teachers: Marital status-Wise

Variable	Sub-category	N	M	S.D.	' t'- value	Significance at 0.05 level
Marital status	Married	165	41.06	7.69	2.305	Significant
	Unmarried	185	37.66	7.21		

It is evident from table 3, that the obtained 't' value 2.305 is higher than the table value 1.96 at 0.05 level of significance. This shows that there is a significant difference between the married and unmarried teachers in terms of ICT literacy among the high school teachers. Further, it is observed that married teachers have more ICT literacy than unmarried teachers. **Hence the hypothesis is accepted**

Hypothesis 5: Academic achievement among the high school teachers is above average.

The average score of the Academic achievement among the high school teachers is found to be 58, while the theoretical average is 50. This shows that the Academic achievement among the high school teachers is above the average level. **Hence the hypothesis is accepted.**

Hypothesis 6: Gender exerts a significant influence on Academic achievement among the high school teachers.

Table 4: Statistical measures and results of test of significance of difference between the means score of academic achievement among the high school teachers: Gender-Wise

Variable	Sub-category	N	M	S.D.	' t'- value	Significance at 0.05 level
Gender	Male	161	59.57	7.27	2.028	Significant

	Female	189	57.56	6.98		

It is evident from table 4, that the obtained 't' value -2.028 is higher than the table value 1.96 at 0.05 level of significance. This shows that there is a significant difference between the male and female teachers in terms of Academic achievement among the high school teachers. Further, it is observed that male teachers have possessed more Academic achievement than female teachers. **Hence the hypothesis is accepted.**

Hypothesis 7: Age exerts a significant influence on Academic achievement among the high school teachers.

Table 5: Statistical measures and results of test of significance of difference between the means score of academic achievement among the high school teachers: Age-Wise

Variable	**Sub-category**	**N**	**M**	**S.D.**	**' t'- value**	**Significance at 0.05 level**
Age	Upto 30 years	182	58.06	7.08	0.865	Not Significant
	31& above years	168	57.24	7.02		

It is evident from table 5, that the obtained 't' value 0.865 is lower than the table value 1.96 at 0.05 level of significance. This shows that there is no significant difference between the upto 30 years and 31 and above years of age teachers in terms of Academic achievement among the high school teachers. Further, it is observed that Age does not influence on Academic achievement among the teachers. **Hence the hypothesis is rejected.**

Hypothesis 8: Marital status exerts a significant influence on Academic achievement among the high school teachers.

Table 6: Statistical measures and results of test of significance of difference between the means score of academic achievement among the high school teachers: Marital Status-Wise

Variable	**Sub-category**	**N**	**M**	**S.D.**	**' t'- value**	**Significance at 0.05 level**
Marital status	Married	165	57.48	6.99	-1.519	Not Significant
	Unmarried	185	59.69	8.22		

It is evident from table 6, that the obtained 't' value -1.519 is lower than the table value 1.96 at 0.05 level of significance. This shows that there is no significant difference between the married and unmarried teachers in terms of Academic achievement among the high school teachers. Further, it is observed that marital status does not influence on Academic achievement among the teachers. **Hence the hypothesis is rejected.**

Hypothesis 9: There is a significant and positive relationship between ICT literacy and Academic achievement among the school teachers.

The obtained value 'r' is 0.354, while the critical value 0.109. Hence there is a significant positive relationship between ICT literacy and Academic achievement among the school teachers. **Hence the hypothesis is accepted.**

Conclusions

The major conclusions arrived at from the study are listed below:

1. ICT literacy among the high school teachers is found high.
2. ICT literacy among the high school teachers is found dependent upon-Genderand Marital status.
3. ICT literacy among the high school teachers is found independent upon-Age.
4. Academic achievement among the high school teachers is found high.
5. Academic achievement among the high school teachers is found dependent upon-Gender
6. Academic achievement among the high school teachers is found independent upon-Age and Marital status.

Educational Implications

Across the globe, traditional libraries—once primarily housing printed books and other physical materials—are gradually being replaced by digital libraries, stocked with electronic resources such as computers, e-books, e-journals, e-databases, and access to the internet. This shift is driven by recent advancements in Information Communication Technology (ICT), which has enabled the production and use of digital content through computer systems. The internet, a vast network of interconnected computers, plays a crucial role in this transformation. Echezona and Ugwuanyi (2010) define the internet as a global system of interconnected computer networks that includes educational institutions, government agencies, businesses, and other organizations. The internet and the World Wide Web have revolutionized access to information, enabling its location and usage in ways previously unimaginable. As Lou et al. (2010) note, the internet provides access to remote computers, electronic mail, file transfer, bulletin boards, discussion forums, blogs, wikis, and various other tools for sharing and disseminating information. By 2008, internet users in Nigeria were estimated to be over 10 million, representing 19.6% of the internet users in Africa (Echezona & Ugwuanyi, 2010). With the widespread availability of internet access through university libraries, cybercafés, mobile phones, and internet modems, it is now possible to access the internet anytime, anywhere.

The use of computers and the internet has become deeply integrated into everyday life, including library services. Today, computers and the internet are central ICT tools found in libraries. The many advantages of using the internet in libraries—such as faster communication, high-speed data processing and retrieval, and remote access—have made it an invaluable resource in the educational sector. University libraries, in particular, are crucial hubs of academic activity, playing a significant role in the educational development and success of students, especially undergraduates.

Given the essential role university libraries play in supporting students' learning, internet access has become indispensable. Technological literacy and the integration of ICT into education have garnered significant attention worldwide. The ability to effectively use ICT is critical to achieving goals in education, economics, and culture (Sarfo et al., 2011). For undergraduates to make full use of the internet, they need a certain level of digital literacy. The global educational challenges cannot be addressed simply by constructing more classrooms or training larger numbers of teachers. The future of education lies in knowledge production, geographical and temporal flexibility, pedagogical innovation, and structural reforms. Building a new society increasingly depends on the integration of ICTs in education. Many governments are now focused on modernizing their educational systems with ICT as a cornerstone of these efforts. Some countries view ICT as essential for enhancing educational quality through curriculum reform, the development of new skills, and the expansion of knowledge. In other nations, ICT is primarily used to broaden access to education for underserved populations, often through radio and television-based self-education programs. Some countries emphasize using technology to transform the educational environment or to meet the specific needs of various student groups.

The impressive potential of ICT applications in teaching and learning suggests that humanity is on the cusp of a new educational revolution—one that will bring about a profound shift across all aspects of human life. This new era, shaped by evolving ICTs and new models of action, calls for a redefined literacy for the information society. Achieving this new literacy requires the creation of new technologies for acquiring scientific knowledge, innovative teaching and learning approaches, new curricula, and updated resources for both teachers and students. This approach aims to stimulate students' intellects, nurture their creative potential, shape their mentalities, and foster a holistic worldview, ultimately preparing them to thrive in the information society.

References

[1] Ali, A., Khan, M., & Hussain, Z. (2010). Improving students' information literacy skills for effective learning.Journal of Educational Technology, 7(2), 89-98.
[2] Echezona, R. I., & Ugwuanyi, L. O. (2010). The impact of the internet on the academic activities of students in Nigeria. International Journal of Digital Information and Communication Technology, 4(1), 31-45.
[3] Katz, I. R., & Macklin, M. C. (2007). ICT literacy: Components, standards and frameworks. International Journal of Educational Research, 15(3), 115-130.
[4] Lou, W. P., Chan, T. H., & Tsai, C. C. (2010). The role of the internet in global education. International Journal of Educational Management, 6(3), 271-284.
[5] Mehra, V., & Newa, D. R. (2009). ICT integration in educational settings: A study on the challenges and opportunities for teachers. Educational Technology Research and Development, 58(1), 5-17.
[6] Oliver, R., & Towers, S. (2000). Developing ICT literacy for the 21st century: Defining essential skills for students. Computers & Education, 34(2), 29-37.
[7] Raji, V. (2014).ICT literacy scale for teachers: Development and validation. Indian Journal of Educational Research, 22(4), 200-215.
[8] Sarfo, F. K., Anamuah-Mensah, J., & Ampiah, J. G. (2011). ICT in education: policy, practice, and challenges in African nations: Educational Technology, 8(4), 47-63.
[9] Vandana Mehra, V., & Dilli Raj Newa, D. R. (2009). ICT integration in educational settings: A study on the challenges and opportunities for teachers. Educational Technology Research and Development, 58(1),5-17.