

Impact of ICT on the Performance of Teaching and Learning Process among the D. El. Ed. Institutions

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Abstract

ICT (Information and Communications Technology) is a very important role in the present Higher Education system for the enhancement of quality education. The present study attempts to analysis the impact of ICT on the performance of teaching and learning process among the students-teachers of the D. El. Ed. institutions of North 24 Parganas district as rural area and Kolkata as urban area of west Bengal. The present study aims to analysis the outcome of ICT based innovation among higher educational institutions viz. D. El. Ed. institutions of North 24 Parganas district as rural area and Kolkata as urban area of west Bengal. The study includes of 300 students of few selected D. El. Ed. institutions in the North 24 Parganas district as rural area and Kolkata as urban area of west Bengal. A self-made questionnaire by the researcher has been used as a tool for administering the present research study. This study has been done by Stratified random sampling technique on students of some D. El. Ed. institutions of North 24 Parganas district as rural area and Kolkata as urban area of west Bengal. The impact of ICT on the performance of teaching and learning process among the D. El. Ed. Institutions with respect to Gender (Male & female), Habitat (Rural & Urban) and Institution type (Government, Government-Aided & Self-finance) was measured by the researcher for administering the present study and it is found that they play a very significant role in ICT based creation.

Key words: D. El. Ed. Institutions, ICT, Performance, Teaching & Learning process.

Introduction

'ICT is the technology needed for information processing, in particular, the use of electronic computers, communications devices and software applications to convert, store, protect, process, transmit, and retrieve information from anywhere, anytime'. There are large economic incentives to merge the computer network system with the telephone networks using a single unified system of signal distribution, cabling, and management. ICT is an umbrella term that contains any communication device, encompassing radio, television, cell phones, computer and satellite systems, network hardware and so on, as well as the various services and appliances with them such as distance learning and video conferencing. ICT must be fully integrated into the pedagogy. The United Nations Educational, Scientific and Cultural Organization (UNESCO), a division of the United Nations, has made integrating ICT into education as part of its efforts to ensure equity and access to education. Information and Communication Technology can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development and more efficient education management, governance, and administration. UNESCO takes a holistic and comprehensive approach to promote ICT in education. Access, inclusion, and quality are among the main challenges they can address. Information and Communication Technology (ICT) in education is referring to the use of computer based communication that assimilates into everyday classroom instructional process. In association with preparing students for the present digital era, teachers are seen as the key players in using ICT in their daily classrooms teaching-learning process. This is due to the potentiality of ICT which prove energetic and proactive teaching-learning environment. ICT training for teachers can also enhance communication

and association between teachers and their students. With the use of technology, teachers can smoothly communicate with their students through messaging apps, email, and online discussion conferences. Technology can facilitate collaboration between students, assignments, allowing them to work together on projects and even if they are not in the same physical location. This can help to develop significant team work and communication skills that are integral for success in the modern workplace. To ensure the successful integration of ICT into the classroom, teachers should become familiar with best practices for teaching with technology. This includes understanding different student learning methods and designing appropriate lesson plans to incorporate ICT tools. Teachers should be comfortable using the hardware and software needed to efficiently teach ICT lessons. ICT training for teachers can help provide teachers with the assurance and skills they need to efficiently use technology in the classroom’.

Review of Literature

Baskey, K. S. (2017). *Work on Use of Ict and Development of Teaching-Learning Activities: A Micro-Study In The District Of Purba Burdwan, West Bengal.*

‘The present paper attempts to analyze the impact of ICT on development of teaching-learning activities among the students and teachers of the surveyed schools in Purba Burdwan district of West Bengal. The study comprises of 120 students and 80 teachers of few selected schools. A nonparametric chi-square test has been used to examine the relationship between use of ICT in school and development of teaching-learning activities among the teachers of the surveyed areas. Also, students’ ‘t’- test has been applied to know whether any significant differences in awareness among the teachers regarding the application of ICT in school and development of teaching-learning activities with respect to gender(Male Female teacher), residing place(Urban Rural) and status of appointment(PGT&TGT)’.

Bhattacharjee, B. and Deb, K. (2016). *Made a study on Role of ICT in 21st Century’s Teacher Education.*

‘ICT is a scientific, technological and engineering discipline and management technique used in handling information, its application and association with social, economic and cultural matters (UNESCO, 2002). ICT stands for Information and Communication Technologies. ICT is a part of our lives for the last few decades affecting our society as well as individual life. ICT which is now broadly used in educational world. Teacher, Student, administrator and every people related to education are popularly used ICT. Teacher use ICT for making teaching learning process easy and interesting. A competent teacher has several skills and techniques for providing successful teaching. So development and increase of skills and competencies of teacher required knowledge of ICT and Science & Technology. In modern science and technological societies education demands more knowledge of teacher regarding ICT and skills to use ICT in teaching – learning process. The knowledge of ICT also required for pre-service teacher during their training programme, because this integrated technological knowledge helps a prospective teacher to know the world of technology in a better way by which it can be applied in future for the betterment of the students. Now – adays ICT’s are transforming schools and classrooms a new look by bringing in new curriculum based on real world problems, projects, providing tools for enhancing learning, providing teachers and students more facilities and opportunities for feedback. ICT also helps teachers, students and parents to come together. Continuous and Comprehensive Evaluation (CCE) helps students as well as teachers to use more technology for making teaching learning more attractive for the betterment of our future generation. Teachers must know the use of ICT in their subject areas to help the learners for learning more effectively. So, the knowledge of ICT is very much essential for the both prospective teachers as well as in-service teachers also. This will help teachers to know integrated technology with classroom teaching. This paper discussed about the role of ICT in 21st Century’s teacher education’.

Barodiya, P. et.al. (2015). *Studied on Use of ICT in Teacher Education.*

‘Professional development to incorporate ICTs into teaching and learning is an ongoing process. Teacher education curriculum needs to update this knowledge and skills as the school curriculum change. The teachers need to learn to teach with digital technologies, even though many of them have not been taught to do so. The aim of teacher training in this regard can be either teacher education in ICTs or teacher education through ICTs. A teacher’s professional development is central to the overall change process in

education. In planning the integration of technology in Teacher education it is important for teacher education, Institution to understand the knowledge and skills necessary for teachers to effectively use ICT in their instructions. Teachers need technical assistance to use and maintain technology. In this paper discusses to study of Teacher education, to know the Significance of ICT in teacher education and to provide the some Suggestions of teacher education’.

Cener E. et. al. (2015) conducted a study “*The Impact of ICT on Pupils' Achievement and Attitudes in Social Studies*”.

‘The aim of this study is to investigate the impact of teaching social studies with the help of CT on pupils’ achievement in social studies. A history, geography and culture oriented theme was selected from the social studies curriculum for the research, Turks on the Silk Road. A multimedia CD, documentaries, PowerPoint and so on were used to teach social studies to 6th graders. The research design of the study is quasi experimental. Three different research tools were used to collect data: an academic achievement test, an attitude measurement scale on social studies education and an attitude measurement scale on ICT. When achievement post test scores were treated as dependent variable in blockwise regression analysis the followings are found: Pupils’ attitudes towards the subject and ICT do not have an effect on their post-test achievement scores. However, their prior knowledge on the subject and the treatment i.e. teaching social studies with ICT have a positive effect on their achievement. Teaching social studies with ICT do not have any statistically significant effect on pupils’ attitudes toward social studies lesson. Thus, it is recommended that teachers and policy makers should find ways to formulate effective ICT integration applications for social studies’.

Devi, S.et.al. (2012). Observed that *ICT for Quality of Education in India*.

‘Information and Communication Technology (ICT) can be utilized for the education sector. Education includes online, distance and part time education. There are unlimited applications of ICT in the real world. In his paper emphasis is on the education field. Traditional Non-formal education system process includes activities like admission, Personal Contact Programmes, Exam for any course in a University or Institution. In this process ICT can play a great role in all the activities by providing a lot of benefits to students, teachers, parents and Universities itself. ICT can be used for providing education to the people who are not able to come to school due to various constraints. ICT can play great role in formal and non formal forms of education. The paper examines certain important issues related with the effective implementation of ICTs in all levels of education and provides suggestions to address certain challenges that would help in the implementation of ICTs in education and simultaneously increasing Quality of education’.

Eng, S. T. (2005). Made a study on *the impact of ICT on learning: A review of research*.

‘Since its introduction to the education arena in the 1960s, computers have both intrigued and frustrated teachers and researchers alike. The many promising prospects of computers and its applications did not materialise, and research into their effectiveness in learning has left many unanswered questions. The methods used in educational research of this nature in the past and present have evolved over the years. Quantitative studies such as meta-analyses are still widely used in the United States while recent large-scale research in United Kingdom used a combination of quantitative and qualitative methods. Findings from these research studies have indicated small positive effects and consequently a need for more in-depth and longitudinal studies into the impact of ICT on learning in the future’.

Aksoy. H. (2003). Made a study on *Influence of ICT applications on learning process in higher education*.

‘Education is the great investment for the future. When investing in education, predicting future parameters and moving according to predictions is an essential part in the education process. In such an important subject, the use of technology cannot be avoided at all. ICT-based educations serves the purpose of both attended and non-attended (distance) education types. The aim of this research is to determine and find out the perceptions of students, motivations and their success rate those study with Information and Communication Technology Based technology supported environments and universities and evaluate these outcomes to find out potential issues of ICT applications through learning process in higher education institutes by conducting survey analysis’.

Zhao, Y. and Frank, K. (2003). Studied on *Factors affecting technology uses in schools: an ecological perspective*.

'Why is technology not used more in schools? Many researchers have tried to solve this persistent puzzle. The authors of this article report on their study of technology uses in 19 schools. They suggest an ecological metaphor, using the example of the introduction of the zebra mussel into the Great Lakes, to integrate and organize sets of factors that affect implementation of computer uses. Their findings suggest that an ecological perspective can provide a powerful analytical framework for understanding technology uses in schools. That perspective points out new directions for research and has significant policy and practical implications for implementing innovations in schools'.

The Research Gaps Identified

From the above studies, researcher has identified the following gaps. The current research work is different from the rest of the studies such as there is little research conducted in West Bengal relating to ICT in education and performance in ICT education among the D. El. Ed. Institutions. So that the current research work makes an earnest attempt to review the researches on ICT in education effect on performance in ICT education among the D. El. Ed. Institutions.

Objectives of the Study

1. To study the difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers on gender basis (Male and female).
2. To study the difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers with respect to habitat (rural and urban).
3. To study the difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers according to their institution types (Govt., Govt.-aided and Self-finance).

Hypotheses of the Study

In this study objective wise hypotheses are-

Ho₁: There is no significant difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers on gender basis (Male and female).

Ho₂: There is no significant difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers with respect to habitat (rural and urban).

Ho₃: There is no significant difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers according to their institution types (Govt., Govt.-aided and Self-finance).

Significance of the study

- Impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers in D. El. Ed. institutions can be known.
- This study will be helpful to the teachers training institutions and teacher-educators in developing positive attitudes of teaching-learning method taught by ICT.
- The result of this study will also be useful as because consideration of gender-wise, habitat-wise and Institution type-wise (Government, Government.-Aided & Self-financed) difference was thoroughly analyzed.

Research Methodology of the Study

Operational Definition of the Key Terms / Variables

Impact

Impact means the action of one object coming forcibly into contact with one another; a marked effect or influence. In this study Impact means Positive and negative, primary and secondary long-term effects of ICT on the performance of teaching and learning process among the D. El. Ed. institutions.

Impact of ICT

Information and communication technology (ICT) may overcome the social and spatial barriers of social interaction by enabling easy, affordable communication and activities of multiple forms (i.e. textual, audio, and/or visual) between the elderly (often with limited mobilization) and others anytime and anywhere. In this study impact of ICT mean the performance of textual, audio and visual teaching and learning process among the students-teachers of D. El. Ed. institutions.

Habitat

In this study rural area from North 24 Parganas district and urban area from Kolkata district has been selected of the west Bengal.

Performance in ICT

In this study Performance in ICT mean reduce the social and spatial barriers of social relation by enabling easy, accessible communication and activities of multiple forms of textual, audio, and visual etc of the students-teachers are considered as performance in ICT.

Research Design

Study falls under the descriptive survey research design has been implemented in the research work of the researcher.

Variables**Independent Variable**

- A) Gender (Males and Females)
- B) Habitat (Rural and Urban areas)
- C) Type of Institutions (Government, Government-aided and Self-finance).

Dependent Variable

- A) Performance in ICT

Sample Size

300 students-teachers in D. El. Ed. institutions of both sexes of rural and urban areas have been selected in the research work of the researcher as sample. All samples have been selected from North 24 Parganas district as rural area and Kolkata as urban area of west Bengal. The constitutions of the sample are as follows:-

Habitat	Type of Institutions						Total
Rural	Government		Government - aided		Self-finance		300
	Male 25	Female 25	Male 25	Female 25	Male 25	Female 25	
Urban	Male 25	Female 25	Male 25	Female 25	Male 25	Female 25	
	Total		100		100		

Sampling Techniques

For the students-teachers selection, Stratified random sampling technique has been implemented in the research work of the researcher of the D. El. Ed. institutions.

Research Tools

A self-made structured questionnaire has been used to collect the data from 6 D. El. Ed. Institutions. Comprising of 300 students-teachers of North 24 Parganas district as rural area and Kolkata as urban area of west Bengal.

Procedure

The procedure of the study which has been followed by the researcher is as follows:

Step 1. At first the questionnaire of ICT in education prepare. Step 2. Selection of D. El. Ed. Institutions as well as selection of students-teachers from different D. El. Ed. Institutions. Step 3. Selection and local adaptation of tools for the study. Step 4. a) Primary data collected from the selected sample groups by the questionnaire. b) Tabulation of test data to meet the requirement of hypothesis testing.

Population

Students-teachers selection Government, Government-aided and Self-finance D. El. Ed. Institutions under the West Bengal University of Teachers' Training, Education planning and Administration of both sexes of rural and urban areas in the West Bengal has been implemented in the research work of the researcher.

Collection of Data

Data have been collected through data collection questionnaires from rural and urban areas in West Bengal. From North 24 Parganas district as rural area and Kolkata as urban area have been taken into consideration.

Method of Analysis of Data

The data have been collected to suitable statistical analysis descriptive statistics like mean, standard deviation and inferential statistics like 't' test, ANOVA have been implemented in the research work of the researcher.

Results

Results based on the objectives, the results of the data are demonstrated in the different tables and its interpretation are given below:

Objective 1

To study the difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers on gender basis (Male and female).

Table 1: Performance in ICT education of Teaching-learning process of students-teachers on gender basis (Male and female).

Variable	Male(N=150)	Female(N=150)	t-value	Sig./not sig.
Performance in ICT education	Mean=44.55 S.D.=7.17	Mean=45.97 S.D.= 8.28	1.95	Not significant at 0.05 level

Table 1 illustrates that the mean, S.D. and 't' scores of the students-teachers of both males (N= 150) and females (N= 150). Though the mean score of females indicates high score (M= 45.97) than the males (M= 44.55), the 't' score (t= 1.95) with degrees of freedom is 298 clearly indicate that there is no significant difference (table value of 't' at 0.05 level is 1.96) between females and males in D. El. Ed. teacher training institutions. So the null hypothesis is H_0 is accepted. Thus, there is no significant difference in the D. El. Ed. teacher training institutions on gender basis. Therefore, male and female students-teachers are equal in terms of performance in teaching taught by ICT in D. El. Ed. teacher training institutions.

Objective 2

To study the difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers with respect to habitat (rural and urban).

Table 2: Performance in ICT education of Teaching-learning process of students-teachers with respect to habitat (rural and urban).

Variable	Rural (N=150)	Urban (N=150)	't' value	Sig./not sig.
Performance in ICT education	Mean=45.37 S.D.= 6.20	Mean=40.38 S.D.= 5.57	1.98	Significant at 0.05 level

Table 2 illustrates that the habitat wise (rural and urban areas) differences in mean, S.D. and t-value of students-teachers of D. El. Ed. teacher training institutions. Though the mean score is high of rural areas than urban areas but the t-value ($t=1.98$) with degrees of freedom is 298 showed significant difference in D. El. Ed. teacher training institutions the two groups (rural and urban areas). So the null hypothesis H_02 is rejected. Thus, there is significant difference in the students-teachers of D. El. Ed. teacher training institutions in respect to habitat. Therefore, rural and urban students-teachers are not equal in terms of performance in teaching taught by ICT in D. El. Ed. teacher training institutions. Urban pupil teachers are more competent in terms of performance while taught through the ICT method.

Objective 3

To study the difference in the impact of ICT on the performance in ICT education of Teaching-learning process of students-teachers according to their institution types (Government, Government-aided, and self-finance).

Table 3: performance in ICT education of Teaching-learning process of students-teachers according to their institution types (Government, Government-aided, and self-finance).

	SS	df	MS	F	P-value	F crit	Sig./not sig.
Between Groups	33.46056	2	18.73528328	0.99060	0.49390798	4.04275303	Not significant at 0.05 level
Within Groups	4175.083	297	20.62987022	73258	6		
Total	4208.544	299					

The above mentioned table 3 shows the ANOVA: Single Factor P value =0.493907986 ($P > 0.05$) is not significant at 0.05 level and H_03 is accepted. It means that there is no significant difference among the Government, Government-aided, and self-finance institutions students-teachers taught by ICT method. Therefore, Govt., Govt.-aided, and self-finance D. El. Ed. teacher training institutions students-teachers are equal in terms of performance in teaching taught by ICT in D. El. Ed. teacher training institutions.

Delimitation of the Study

The present study has been delimited to the following:-

- ❖ The study has been delimited to three independent variables - Gender (Males and Females), Habitat (Rural and Urban areas), Type of Institutions (Government, Government-aided and Self-finance) and one dependent variable -Performance in ICT.
- ❖ The study has been delimited to the students-teachers of different D. El. Ed. institutions of North 24 Parganas district as rural area and Kolkata as urban area only.
- ❖ Sample has been also delimited to a fixed sample size of 300 (three hundred) only.

Discussion of the Study

In this study, the investigator found that there is no significant difference in the performance in teaching taught by ICT in D. El. Ed. teacher training institutions of male and female students-teachers but it is

concluded that there exists a significant difference in the performance in teaching taught by ICT method in D. El. Ed. teacher training institutions between rural and urban students-teachers. At last but not least, the investigator found that there is no significant difference among Government, Government-aided, and self-finance D. El. Ed. teacher training institutions students-teachers taught by ICT method.

Conclusion

Therefore, it can be concluded that the teaching-learning skills of the students-teachers in D. El. Ed. teacher training institutions do not affect by their gender in the use of ICT i.e. male and female student-teachers have the same ability to learn through ICT system but on the other hand, it is seen that in all the D. El. Ed. teacher training institutions there is different performance among the students-teachers in rural and urban areas in using ICT. All the students-teachers in Government, Government-aided, and self-finance D. El. Ed. teacher training institutions have shown equal efficiency in teaching by ICT i.e. there is no comparative difference among the students-teachers of Government, Government-aided, and self-finance D. El. Ed. teacher training institutions in teaching taught by ICT techniques.

In the 21st century, the use of ICT has changed dangerously with the advancement of technology so in the end, we can say that the use of ICT in education is not just a modern object but a timely medium for students-teachers. The student convention must come forward in a combined manner so that the use of ICT finds its correct instruction in the field of education. ICT use in education helps to make teaching and learning interesting which leads the student to process in learning and the students get the succeed of classroom learning in their own home as well as in the classroom through the use of ICT.

Recommendations

D. El. Ed. Teacher training institutes can more positive role in teaching through ICT which will enable students to become more expert in using ICT in classroom education and bridge all the gaps in ICT use, although many rural D. El. Ed. Teacher training institutions still do not make sufficiently use of ICT. Yet there are also obstacles and problems in many rural institutions today. The use of ICT in education will be more adequate and above all, it will be able to take advantage of ICT. It can also be said that the positive role of the board of directors of D. El. Ed. Teacher training institutes are undeniable in terms of ICT-based teaching-learning. They will provide sufficiently funding for ICT teaching. At last but not least, the teachers will inspire the students to learn ICT connected fiber.

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