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ICT and its Impact on the Performance of Teachers Working in the Higher Education Institutions – A Comparative Study with Special References to Bangalore and Chennai Metropolitan Cities

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Abstract

By using a variety of information and resources and examining information from multiple perspectives, computers and the Internet have been hailed as potentially effective tools for empowering users to make educational changes and improvements. This, in turn, has been said to foster the authenticity and reality of learning situations. Through simulations that complement actual learning scenarios, ICT aids in simplifying difficult concepts. ICT may therefore support higher order thinking and dynamic learning. The primary data will collect through survey method. Survey can be conducted using well formulated Questionnaire. Researcher will use 250 questionnaires for collection of data from the respondents through Google form. The primary objective of the study is to determine the influence of application of ICT towards the performance of teachers in higher education on factor determining teacher performance in higher education. Application of ICT towards the Performance of Teachers in Higher Education have significant and positive influence on Factor Determining Teacher Performance in Higher Education. The relationship is significant and positive therefore change in Application of ICT towards the Performance of Teachers in Higher Education leads change in Factor Determining Teacher Performance in

Higher Education. Higher Application of ICT towards the Performance of Teachers in Higher Education leads to higher Factor Determining Teacher Performance in Higher Education.

Keywords: Internet, Information, Performance and Learning.

I. INTRODUCTION

Information and communications technology (ICT) is an extensional term for information technology (IT) that emphasises the role of integrated communication and the integration of telecommunications (telephone lines and wireless signals) and computers, as well as the necessary software for businesses, middleware, storage, and audio-visual systems, which allow users to access, store, transmit, and manipulate information.

The term ICT is also referring to “*the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system*”. There are significant economic incentives to combine the telephone network and the computer network systems into a single unified system of cabling, signal distribution, and management. ICT is an umbrella phrase that refers to any communication equipment, including radios, televisions, mobile phones, computers or laptops, network infrastructure, and satellite systems, as well as the myriad services and appliances that go with them, such as videoconferencing and distance learning.

Information and communication technology is one of the most important new technologies, with applications in every aspect of human activity. It has undergone significant transformations throughout the years, making teaching and learning easier and more pleasant, as well as changing the ways people live, learn, work, and play. As a result, the internet has become an indispensable tool in today's information culture, and a future without it is unfathomable (Adelakun et al., 2020). This study will look into how information and communication technology affects students' learning engagement and academic achievement. According to UNESCO, information and communication technology (ICT) is a technological and engineering field that employs scientific and management methodologies to handle information (Ratheeswari, 2018). As a result, it employs many technologies to record, communicate, gather, analyse, store, and distribute the information required to complete a certain task more quickly (BobillierChaumon et al., 2014; Pedagoo, 2020). It is important to highlight that the Covid-19 Pandemic caused numerous higher education institutions in poor nations to implement digital technology for the learning process (Adelakun & Omolola, 2020).

Review of Literature

Computers and the Internet have been touted as potentially capable means to empower the users for educational changes and improvement, by utilizing various information and resources and reviewing information from different points of view; hence, cultivating the authenticity and actuality of learning situations (Tinio, 2003). ICT helps to make complicated things simple to comprehend by simulations that once more add to real learning situations. Hence, ICT may act as a facilitator of dynamic learning and higher order thinking (Alexander, 1999).

ICT is an augmented term for information technology (IT) which accentuates on the role of integrated communications (Murray,2011) and the integration of telecommunications (telephone lines and wireless signals), computers and other necessary enterprise software (Foldoc,2008). Singh (2013) defines ICT as a collection of technical devices and resources which are used to transmit, store and manage information; however, the utilization of ICT in the instructive process has been partitioned into two general classifications: ICT for education and ICT in education. ICT for education suggests the development of ICT particularly for teaching and learning purposes and ICT in education includes the adoption of general parts of ICT in the instructional process (Okoro & Ekpo,2016).

The advent of ICT has revolutionized the existence and activities of modern man, particularly in the context of globalization (Evey, Emmanuel, Joseph, Denis, &Asinde, 2010). In recent years, there has been extensive national and worldwide lobbying for the use of ICT in the instructional and learning process (Okoro & Ekpo, 2016). ICT has influenced the educational area, specifically the instructional process and research. Davis and Tearle (1999), as cited in Yusuf (2005), believe that ICT has the potential to accelerate, improve, and broaden aptitude reforms because it has the ability to boost teaching by inspiring and engaging learners, as well as assist schools in understanding financial and functional practices. Ashley (2016) reiterates that technology assists educators in preparing students for the real world and emphasizes that as our countries become more technologically dependent, it becomes increasingly important that students learn how to be well-informed about ICT in order to be good citizens.

Significance of Proposed Work

The available international and national research works of literature have concluded that the ICT transforming to the stakeholders of Schools and colleges of urban, semi-urban, and also rural parts of the countries at national and international level. The majority of recent studies on ICT transformation at urban and semi urban places and also only at school level about the students. But the available literature does not discuss much about the ICT transformation to performance of the teachers in Higher Education. There is no strong research for

the ICT and its impact on the performance of the teachers working in higher education institutions. Therefore, the present study tries to look at the area of ICT and the influence in the performance of the teachers in Higher Education from the metropolitan cities of Bangalore and Chennai.

Objective of the Study

1. To study the impact of ICT in performance of the teacher in Higher Education.
2. To analyses the application of ICT towards the performance of teachers in higher education level.
3. To know the level of usage of the ICT tools among the teachers working in Higher Educational Institutions in Chennai and Bangalore metropolitan cities by comparison.
4. To provide proper suggestions to improve the ICT usage among the teachers for the better performance and Upliftment of the students.

Research Methodology

This study is analytical and exploratory in nature and used survey method for the findings. The study depends on primary data collected though the questionnaire from the teachers working in higher educational institutions. Chennai and Bangalore Metropolitan City is proposed to select for the study. Convenient sampling technique will be used in the study to select the sample population from Chennai and Bangalore, the respondent being those who have influence of ICT on the transformation of higher education.

The study is be conducted using both analytical and descriptive type of methodology. The study primarily depends on primary and secondary data. The Survey will be conducted in Chennai and Bangalore Metropolitan cities which consist of Teachers who are working in the higher educational institutions making the study realistic and meaningful. The area consists of different Government, Aided and Self-finance colleges and universities. As the people do not depend on the technology, and they may be depend on traditional activities, by which, they can do their performance in teaching, in turn it leads the growth of the Higher education among the metropolitan cities of the country.

The perception of ICT and higher education has influenced the performance of the teachers in higher education and employment for creating income. The attractive parameters include ICT applications, infrastructure, promoting various ICT based extracurricular activities and government policies. Simple Random Sampling will be applied for generating data. Samples for

the purpose of the study are selected systematically. Simple Random Sampling method will be applied to collect the responses.

The primary data will collect through survey method. Survey can be conducted using well formulated Questionnaire. Researcher will use 250 questionnaires for collection of data from the respondents through Google form. The Secondary data can be collected from Journals, Magazines, Publications, Reports, Books, Dailies, Periodicals, Articles, Research Papers, Websites, Manuals and Booklets.

A pilot study will be conducted to validate the questionnaire and to confirm the feasibility of the study. The filled-up Questionnaires will be collected from the respondents to test the reliability. The quality of the questionnaire will ascertain and the test can show reliability. The variables can be considered for the analysis to satisfy the normal probability distribution. Based on the pilot study, the questionnaire can be modified suitably to elicit response from the sample group.

Data Analysis and Interpretation

The collected data is subjected to statistical analysis using both at univariate and multivariate statistics. Below are the statistical test used to analysis the data collected.

Table 1: Factorization of Application of ICT towards the Performance of Teachers in Higher Education (AICTPTHE)

Factor	EAPD variables	Factor Loading	Mean	Std. Deviation	Eigen Value	Variance Explained
Educational Resources and Accessibility Factor (ERAF)	Create a diverse range of educational resources and media	0.724	3.470	1.158	4.835	35.296%
	Ensure people have fair access to education and knowledge	0.807	4.270	1.270		
	Create framework for gathering and disseminating educational information	0.795	3.650	1.140		
	Encourage technology awareness and distance learning	0.846	3.550	1.297		
	Encourage others to share their knowledge and experience	0.882	4.310	0.991		
Experience and Effectiveness Factor (EEF)	To support sharing experience and information with others	0.917	4.740	1.021	3.625	18.543%
	Assist in development of new teaching skills and increase the effectiveness of classroom instruction	0.953	3.640	1.039		
	Serves as a supportive tools for teaching and learning	0.887	0.560	0.988		
	Assists in motivating students and inculcating a love for knowledge and learning	0.753	3.750	0.967		
	Serves as a repository for educational records	0.833	3.500	1.000		
Instructiveness Factor	Enable teachers to interact effectively with students.	0.825	3.460	1.086	2.251	10.429%
KMO: 0.862, Chi-Square: 238.219, Df: 86 and P value: 0.000				Total Variance Explained: 64.268%		

Table 1 shows factorization 11 Application of ICT towards the Performance of Teachers in Higher Education (AICTPTHE) variables, out of 11 Application of ICT towards the Performance of Teachers in Higher Education (AICTPTHE) variables three independent factor have been extracted, which

explaining total variance of 64.268% of variance. The KMO value of 0.862 with Chi-square value of 238.219 and P value of 0.000 indicates that factor analysis can be used to those 11 Application of ICT towards the Performance of Teachers in Higher Education variables. The first dominant factor 1 with Eigen value of 4.835 which explaining 35.296% of variance in AICTPHE and it contain 5 variables namely Create a diverse range of educational resources and media, Ensure people have fair access to education and knowledge, Create framework for gathering and disseminating educational information, Encourage technology awareness and distance learning and encourage others to share their knowledge and experience in the order of their importance within the variables it has been labelled as **Educational Resources and Accessibility Factor (ERAF)**. The second dominant factor 2 with Eigen value of 3.625 which explaining 18.543% of variance in AICTPHE and it contain variables such as support sharing experience and information with others, Assist in development of new teaching skills and increase the effectiveness of classroom instruction, Serves as a supportive tools for teaching and learning, Assists in motivating students and inculcating a love for knowledge and learning and Serves as a repository for educational records based on their relative importance within the variables it has been labelled as **Experience and Effectiveness Factor (EEF)**. The third dominant Factor 3 with Eigen value of 2.251 which explaining 18.543% of variance in AICTPHE and it contain variables namely Enable teachers to interact effectively with students it has been termed as **Instructiveness Factor**.

Tabel 2: Factor Determining Teacher Performance in Higher Education (FDTPHE)

Factor	EAPD variables	Factor Loading	Mean	Std. Deviation	Eigen Value	Variance Explained
Teacher Orientation Factor (TOF)	Teaching skill and experience	0.824	3.47	1.158	2.495	22.677 %
	Motivation of teachers	0.707	3.27	1.270		
	Passion of teachers	0.695	3.65	1.140		
	Opportunity for professional development	0.884	3.55	1.297		
	Updating of latest teaching methods	0.782	3.31	0.991		
	Work load and stress	0.835	3.74	1.021		
Supportive Institutional Factor (SIF)	Leadership and administrative support	0.573	3.64	1.039	2.063	18.755 %
	Resources and infrastructure	0.807	3.56	0.988		
	Institutional culture	0.553	3.75	0.967		
	Student characteristic	0.533	3.50	1.000		
	Academic preparedness	0.825	3.46	1.086		
External Factor (EF)	Regulations and policies related to higher education	0.847	4.110	0.811	1.836	16.690 %
	Societal expectation and pressure	0.667	4.140	0.819		
	Economic condition	0.556	3.940	0.923		
KMO: 0.794, Chi-Square: 1982.660, Df: 55 and P value: 0.000				Total Variance Explained: 68.112%		

Table 2 reveals factorization of 14 Factor Determining Teacher Performance in Higher Education (FDTPHE) variables, out of 14 application of Factor Determining Teacher Performance in Higher Education (FDTPHE) variables three independent factors have been extracted, which explaining variance of 68.112% of variance. The KMO value of 0.794 with Chi-square value of

1982.660 and P value of 0.000 indicating that factor analysis can be used to those 14 Factor Determining Teacher Performance in Higher Education variables. The first dominant factor 1 with Eigen value of 2.495 which explaining 22.677% of variance in FDTPHE and it contain Teaching skill and experience, Motivation of teachers, Passion of teachers, Opportunity for professional development, Updating of latest teaching methods and Work load and stress based on relative significance it has been labelled as **Teacher Orientation Factor (TOF)**. The second dominant factor 2 with Eigen value of 2.063 which explaining 18.755% of variance in FDTPHE and it consist of variables namely Leadership and administrative support, Resources and infrastructure, Institutional culture, Student characteristic and Academic preparedness based on the importance of variables it has been termed as **Supportive Institutional Factor (SIF)**. The third dominant factor 3 with Eigen value of 1.836 which explaining 16.690% of variance in FDTPHE and it consist of three variables namely Regulations and policies related to higher education, Societal expectation and pressure, Economic condition based on the relative significance it has been named as **External Factor (EF)**.

Table Significances influence of Application of ICT towards the Performance of Teachers in Higher Education on Factor Determining Teacher Performance in Higher Education

	Unstandardized Coefficients		Standardized Coefficients	t	P value
	B	Std. Error	Beta		
(Constant)	65.498	2.759		23.744	0.000**
AICTPTHE	1.209	0.299	0.377	4.048	0.000**
R=0.564, R²=0.499, Adjusted R²=0.482, F value: 14.226, P value<0.000					

Table 3 reveals the linear combination of Application of ICT towards the Performance of Teachers in Higher Education (AICTPTHE) which significantly influencing Factor Determining Teacher Performance in Higher Education {F=14.226, P<0.000}. The coefficient of determination explaining 49.9% of variance in that influencer. Application of ICT towards the Performance of Teachers in Higher Education have significant and positive influence on Factor Determining Teacher Performance in Higher Education. The Beta value of 0.377 shows that one unit change in Application of ICT towards the Performance of Teachers in Higher Education leads to 0.377-unit change in Factor Determining Teacher Performance in Higher Education. Hence, application of ICT leads to enhance teacher performance in higher education institution.

Results and Discussion

11 Application of ICT towards the Performance of Teachers in Higher Education (AICTPHE) variables three independent factor have been extracted, which explaining total variance of 64.268% of variance. The first dominant factor 1 with Eigen value of 4.835 which explaining 35.296% of variance in AICTPHE and it contain 5 variables namely Create a diverse range of educational resources and media, Ensure people have fair access to education and knowledge, Create framework for gathering and disseminating educational information, Encourage technology awareness and distance learning and encourage others to share their knowledge and experience in the order of their importance within the variables it has been labelled as **Educational Resources and Accessibility Factor (ERAF)**. The second dominant factor 2 with Eigen value of 3.625 which explaining 18.543% of variance in AICTPHE and it contain variables such as support sharing experience and information with others, Assist in development of new teaching skills and increase the effectiveness of classroom instruction, Serves as a supportive tools for teaching and learning, Assists in motivating students and inculcating a love for knowledge and learning and Serves as a repository for educational records based on their relative importance within the variables it has been labelled as **Experience and Effectiveness Factor (EEF)**. The third dominant Factor 3 with Eigen value of 2.251 which explaining 18.543% of variance in AICTPHE and it contain variables namely Enable teachers to interact effectively with students it has been termed as **Instructiveness Factor**.

14 application of Factor Determining Teacher Performance in Higher Education (FDTPHE) variables three independent factors have been extracted, which explaining variance of 68.112% of variance. The first dominant factor 1 with Eigen value of 2.495 which explaining 22.677% of variance in FDTPHE and it contain Teaching skill and experience, Motivation of teachers, Passion of teachers, Opportunity for professional development, Updating of latest teaching methods and Work load and stress based on relative significance it has been labelled as **Teacher Orientation Factor (TOF)**. The second dominant factor 2 with Eigen value of 2.063 which explaining 18.755% of variance in FDTPHE and it consist of variables namely Leadership and administrative support, Resources and infrastructure, Institutional culture, Student characteristic and Academic preparedness based on the importance of variables it has been termed as **Supportive Institutional Factor (SIF)**. The third dominant factor 3 with Eigen value of 1.836 which explaining 16.690% of variance in FDTPHE and it consist of three variables namely Regulations and policies related to higher education, Societal expectation and pressure, Economic condition based on the relative significance it has been named as **External Factor (EF)**.

The coefficient of determination explaining 49.9% of variance in that influencer. Application of ICT towards the Performance of Teachers in Higher

Education have significant and positive influence on Factor Determining Teacher Performance in Higher Education. The Beta value of 0.377 shows that one unit change in Application of ICT towards the Performance of Teachers in Higher Education leads to 0.377 unit change in Factor Determining Teacher Performance in Higher Education. Hence, application of ICT leads to enhance teacher performance in higher education institution.

II. CONCLUSION

The impact of information and communication technology on students' learning engagement and academic performance has been observed. According to UNESCO, Information and communication technology (ICT) is defined as a technological and engineering discipline that uses scientific and management techniques in information handling. Hence, it uses different technologies to capture, communicate, collect, analyses, store and distribute the information needed to perform a specific task faster. It is imperative to note that the outbreak of the Covid-19 Pandemic forced several higher institutions of learning in developing countries to adopt digital technology for the learning process. The primary data will collect through survey method. Survey can be conducted using well formulated Questionnaire. Researcher will use 250 questionnaires for collection of data from the respondents through Google form. The primary objective of the study is to determine the influence of application of ICT towards the performance of teachers in higher education on factor determining teacher performance in higher education. Application of ICT towards the Performance of Teachers in Higher Education have significant and positive influence on Factor Determining Teacher Performance in Higher Education. The relationship is significant and positive therefore change in Application of ICT towards the Performance of Teachers in Higher Education leads change in Factor Determining Teacher Performance in Higher Education. Higher Application of ICT towards the Performance of Teachers in Higher Education leads to higher Factor Determining Teacher Performance in Higher Education.

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