

Indicators for measuring the impact of ICT in education – A Parametric Approach

Dr.J. Meenakumari

Prof & Head

Department of Computer Science and Applications, The Oxford College of Science, Bangalore

Abstract— *Ascertaining the impact of ICT (Information and Communication Technology) in higher education is an ongoing activity. Either the positive or the negative impact of ICT use in teaching-learning process is not proven in any studies. The lack of well-defined parameters for measuring the impact is one of the primitive reasons for this problem. There is a critical need to standardize the parameter upon which the impact of ICT could be measured. This paper summarizes the impact of ICT together with guidelines for formulating the parameters.*

Keywords— *ICT (Information and Communication Technology), impact, parameter, teaching-learning process, higher education.*

I. INTRODUCTION

Many studies insist that the goals for the ICT implementation should be clear otherwise the outcome cannot be measured. ICT could be used for multifarious aspects in higher education and identifying the core areas in which it could be used forms the first step. Teaching– learning is a recurrent activity and hence classification of task has to be done carefully. The role of ICT starts much before the actual teaching-learning process. Ideally from motivating the students towards using various form of ICT and also setting an example by using them efficiently. The usage of ICT in turn is based on the availability. Availability of computers only in the prescribed laboratories and on scheduled timing may not be more meaningful. The availability computer inside the lecture hall adds lot of value in terms of explanation and understanding. It could be made available in the form of few desktops/laptops/personal digital assistant/mobile devices. Only when computers are made available in the entirety of the teaching learning process the impact of its usage can be studied.

II. THEORETICAL BACKGROUND

ICT may deliver significant educational benefits by providing tools for the teaching and learning process and by providing the skills needed in a society that is increasingly reliant on ICT. According to various studies it is clear that ICTs are used differently in different context and hence it becomes difficult to measure its impact. However the most discussed policy question with respect to ICT implementation is its impact on educational outcomes. However many studies have categorized that ICT impacts are oriented towards socio economic factors. Further, OECD (2007) discussed that one of the major impact component as access and usage. Literature also revealed that when computers and the Internet are used in class, ICT has a strong motivational effect and positive effects on behaviour, communication and process skills.” (Allan, 2008). It is very evident that the development of an ICT plan, ICT support, and ICT training together with the collaborative approach is required for better positive impact.

The first step to measure the impact is to derive primary and secondary indicators that contribute to ICT implementation. The following parameters were considered as primary indicators as per the study conducted by (UNESCO-UIS, 2006) : Infrastructure Access; ICT use; Teacher Training; ICT Support. Qualitative factors for assessing progress, and quantitative data, the timing of monitoring and impact assessments are to be considered as primary indicators according to the study conducted by Wagner(2005). Technology adoption was considered as primary indicator in the study: “How ict is transforming societies, cultures, and economies by Research Report the linked world”. The speed of internet was also considered as one of the indicator according to the study conducted by Edgar TELLO-LEAL et al(2012).

“ICT may impact students’ motivation”. Becker (2000) found that ICT increases student engagement, which leads to increased amount of time students spend working outside class time. The body of evidence on the impact of ICT on intermediate outcomes, such as motivation, engagement with and independence in learning, is greater and more persuasive Becta (2005), and hence motivation and engagement could be considered as secondary indicators. Indicators are required to show the relationships between technology use and educational performance

Although action research reveals that ICTs can empower teachers and learners, provide a learning environment that helps address different learning styles, and foster the development of ‘21st century skills’, current peer reviewed studies to support these beliefs are still limited. Intensity of usage of computers is also a major factor to be included according to

UNCTAD report. "ICT seems to have a deep impact on the process of learning in higher education by offering new possibilities for learners and teachers.

These possibilities can have an impact on student performances and achievement" according to Adel Benyoussef and et.al(2010) . ICT access is again considered as a major factor for measuring the impact according to the study conducted by Empirica (2006).

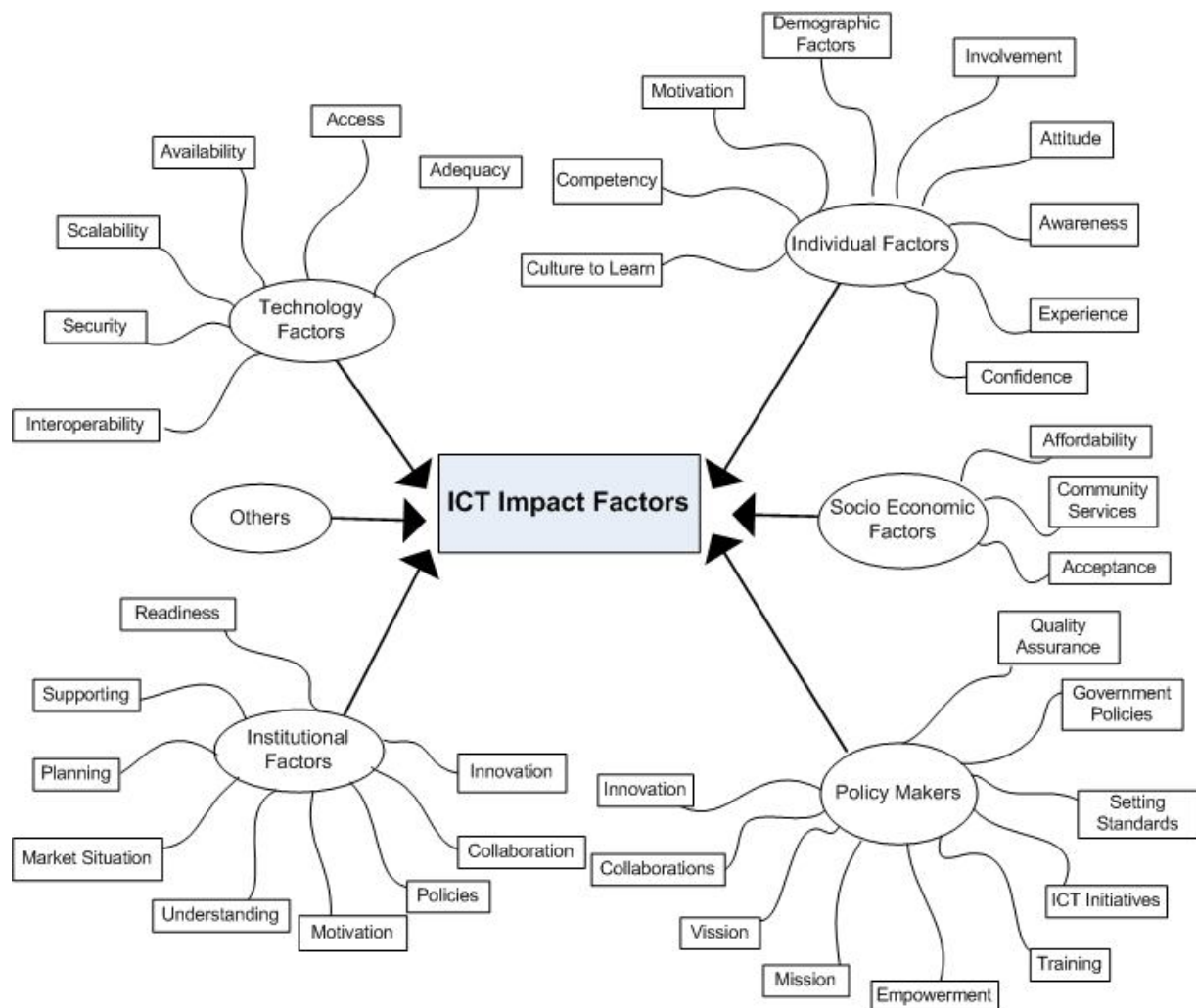


Fig 1 A parametric model for assessing the impact of ICT implementation in Higher education Institutions

III.INFERENCES

Many theoretical and empirical efforts have been made to assess the impact of ICT in higher education institution scenario. In common the literature reveals that the impact has to be ascertained from multifarious perspectives. Hence after intense literature review the above model has been arrived as shown in Fig 1.This depicts the primary and secondary parameters to be considered for measuring the impact of ICT in higher education institutions. The first level parameters includes the individual parameters, institutional parameters, technology factors, socio economic factors and the policy makers together with certain other factors as mentioned in Fig 1.

The individual and institutional factors are equally important to achieve a positive impact on ICT implementation. The foremost being the individual inclination towards usage of ICT-based technology into the process. The various attributes like attitude of the individual, involvement, confidence, competency, experience etc., play a vital role while contributing to the individual parameter. In addition there are few demographic factors like age, qualification, nature of work, type of institution etc that account for considerable aspects for individual factors. Every education institution should play a vital role in planning and supporting innovative ideas for better sustainability. The yet another important factor is the readiness which is required to evolve around the dynamic technology bound environment. Collaboration is an important factor as it helps in achieving the outcomes better.

It can be concluded that for better implementation results the management should understand the marketing situation well and motivate all the stakeholders towards the usage of ICT.

The technological parameters also play a predominant role in the study of impact of ICT in higher education institutions. The various aspects such as availability, accessibility, scalability, adequacy, interoperability are all major factors that play a role in technology. Among all the factors, availability and accessibility are accountable to larger extent according to many studies. Security and scalability issues are the next in the hierarchy. The security of information is really a challenge and it needs to be maintained properly.

Affordability and level of acceptance are the two major parameters indicated under socio-economic factors. Many a time affordability and acceptance to change becomes a major issue. The yet another primary factor includes the policy makers. Innovation and invention are the need of the day hence lot of encouragement towards innovation and quality should be given. The policy makers also should pave way for collaborative work to yield better outcomes. Reformation of certain government policies and setting considerable targets would help all stakeholders to take higher education system to greater heights.

IV. CONCLUSION

Measuring the impact of ICT implementation is in a very early stage and there is no well defined standard or procedure to be adapted. As a first step this paper highlights the importance of defining the parameters to measure the impact. In this paper various primary and secondary parameters have been identified that needs to be ascertained for determining the ICT impact. A model has been proposed in Fig 1 and the inferences were also discussed.

REFERENCES

- [1] Adel BEN YOUSSEF, The impact of ICT's on students' performance in Higher Education: Direct effects, Indirect effects and Organizational change* European Commission, eLene-EE project,2010
- [2] Allan H.K. Yuen et.al , Factors Predicting Impact of ICT-Use on Students: An Exploration of Teachers' Perceptions, The Proceedings of IRC 2008
- [3] Becta, Personalised Learning with ICT. Coventry: Becta
- [4] http://www.becta.org.uk/corporate/publications/documents/personalised_learning.pdf,2005
- [5] Becker H. J., Pedagogical motivations for student computer use that leads to student engagement. Education Technology 40(5), 5-17. (2000)
- [6] Edgar et.al,The Digital divide: ICT DEVELOPMENT INDICES IN MEXICO Journal of Community Positive Practices 4/2012 pp.
- [7] Empirica, Benchmarking access and use of ICT in European schools 2006. Bonn: Empirica. Retrieved February 02, 2012 from http://www.empirica.com/publikationen/documents/No08-2006_learnInd.pdf,2006
- [8] Measuring the impact of ICT use in business: the case of manufacturing in Thailand, United Nations Conference on Trade and Development, UNCTAD report, United Nations New York and Geneva, 2008
- [9] The Linked World: How ICT Is Transforming Societies, Cultures, and Economies, RESEARCH REPORT TCB R-1476-11-RR INC. www.conferenceboard.org
- [9] OECD (2007). Measuring the Impacts of ICT Using Official Statistics. Working Party on Indicators for the Information Society. DSTI/ICCP/IIS(2007)1/FINAL. The Katalyst project audit experience according to DCED standards,<http://www.enterprise-development.org/media/KatalystDCEDstatement.pdf>
- [10] Unesco(2006)- www.uis.unesco.org
- [11] Wagner et.al, Monitoring and Evaluation of ICT in Education Projects: A Handbook for Developing Countries. Washington, DC: infoDev /World Bank. Available at: <http://www.infodiv.org/en/Publication.html>,2005