

Digitalization and Its Influence on Higher Education in India

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ABSTRACT

Digitalization has emerged as a transformative force in higher education in India, reshaping teaching–learning processes, governance, and access to knowledge as well as synthesis of the evidence from meta-analysis about the impact of the use of digital technology in schools or college on student’s attainment, or more widely the impact of digital technology on academic achievement in the scenario of the Indian Higher Education Area (IHEA). Through a quantitative methodology, we identified the factors and variables that condition and favor the use of digitalization in university studies. The factor-based structure enabled a holistic view of ICT innovation in universities across three key areas: Teaching model (face-to-face/distance), area of study, and generic competencies. The outcomes could be used as means to forecast, explain, and improve the integration of these digital mobile devices and tablets for fostering learning activities and generic competencies in the Higher Education context.

Keywords- Digital apparatus for Education, Mobility, Ubiquity, Generic competencies, IHEA.

I. INTRODUCTION

Digitalization has influenced pedagogical practices by encouraging student-centered learning, interactive content, and data-driven academic planning. Higher education plays a pivotal role in the development of a country, as it is viewed as a powerful means to build knowledge based society. In India, higher education imparted by universities is facing challenges in terms of access, equity and quality. The Government of India has taken several initiatives during the eleventh five year plan period to increase access to higher education by adopting state specific strategies, enhancing the relevance of higher education through curriculum reforms, vocational programs, networking, information technology adoption and distance education along with reforms in governance.

However in terms of Gross Enrollment Ratio (GER), India still lags behind the worldwide average and emerging countries like Brazil and China. The Indian Higher Education System has established itself as the largest system in the world in terms of number of institutions and third largest in terms of student enrollment (after China and USA) while several new institutions have emerged due to significant increase in

private sector participation over the last few years, concerns remain regarding the quality of education being imparted to students.

In the last few decades the role of technology in education has been an important question since the potential of computer technology to transform Skinner’s teaching machines was recognised in the 1960s. It remains an important issue today with debates about the impact of technology on our society and educations, the implications of quick and easy online access to information for knowledge and learning and the effect of technology on young people’s social, emotional and physical development frequently in the news. All experts suggest that the important to take stock of what we know about the impact of digital technology on education from what we have learned over the last fifty years.

In india, only a small relationship between computer use in the school curriculum and improvement in pupils’ test scores was found in a longitudinal study as Hattie et. al. (1996) discussed about the effects of learning skills interventions on student Learning and identify features of study skills interventions that are likely to lead to success. Via a meta-analysis they examine 51 studies in which interventions aimed to enhance student learning

by improving student use of either one or a combination of learning or study skills. Such interventions typically focused on task-related skills, self-management of learning, or affective components such as motivation and self-concept. Using the SOLO model, they categorized the interventions (a) into four hierarchical levels of structural complexity and (b) as either near or far in terms of transfer. They examined the support to notion of situated cognition, whereby it is recommended that training other than for simple mnemonic performance should be in context, use tasks within the same domain as the target content, and promote a high degree of learner activity and meta-cognitive awareness. Again Andrews et al. (2002) studied that a large amount of money has been invested in the provision of computers in schools, and many young people are increasingly using them to research, compose and present homework. However questions remain about the impact of ICT on schooling, and in particular, on literacy learning. They investigated the impact of networked technologies the internet and email on literacy learning. Again Harrison et al. (2004) identified statistically significant findings positively associating higher levels of ICT use with school achievement at each key stage, and in english, maths, science, modern foreign languages and design technology. An association between high ICT use and higher pupil attainment in primary schools was also reported in an earlier Teacher Training Agency study through the interpretation by the research team was that more effective teachers (and more effective schools) tended to use more innovative approaches, or chose to use the ICT resources that they had more appropriately, rather than that the technology itself was the cause of the differences in pupil performance and Higgins et. al. (2007) studied that the literature on interactive whiteboards learning, media and technology and found that the existing literature on the introduction and use of interactive whiteboards (IWBs) in schools and they summarise the key issues arising from that analysis in order to provide a context for the articles which follow in this special issue of "Learning, Media and Technology. That article reviews the evidence about the initial adoption of the technology in classrooms, the existing empirical evidence of its impact on teaching and learning in schools as well as presenting an analysis of some of the underlying theoretical and conceptual issues. Also Kanuka and Kelland (2008) studied about e-learning delivered on its promises and They included of that study was to determine the extent of agreement among experts on the impact of e-learning technology in Canadian higher education learning experiences. Fourteen participants who are experts in e-learning in higher education agreed there are contentions about e-learning technologies in the areas as a platform for ideal speech, greater opportunities for interactions, the extent to which communities of learners can be created, provision of a new kind of learning environment, a platform for discussions, demand for e-learning by students, the degree to which the

environment is equal and equitable and quality of the learning experience. They indicated the value of e-learning requires further research before higher education leaders and teacher-practitioners are willing to incorporate them in teaching practices and policy documents. Tamim et. al. (2011) discussed about the reports on the use and potentials of Learning Platform (LP) technologies for organizing learning in school or colleges, that reports on the findings of qualitative research on the benefits of LPs based on data from case studies in 12 'early adopting' English school or colleges. They present reports to findings on the potential of LPs to enhance student access to a broad range of learning resources, to increase opportunities for independent and personalised learning, to support opportunities for collaborative learning and to improve student processes of reflecting on and assessing their learning. They concludes by drawing out some of the pedagogic implications from these findings and with a brief summary of the emerging conditions associated with the effective use of LPs to support and organize learning while OWINO (2013) discussed about the impact of e-learning on academic performance: a case study of group learning sets and they focused on the impact of e-learning on academic performance. The study relates to a level one undergraduate module delivered using traditional lectures and e-learning based methods. E-learning has been revealed in this study not to have a positive impact on academic achievement contrary to the expectations. Pega (2014) studied the information and communication technology in higher education in india: challenges and opportunities. Again Lonka and cho (2015) studied the innovative schools teaching and learning in the digital era and they examined that digital revolution is transforming our organizations and our routines. It is transforming the way children and young people play, access information, communicate with each other and learn. But, so far, this revolution has not transformed most schools or most teaching and learning process in classrooms. There is no doubt that education has an important role to play in increasing the European and Asian competitiveness and reducing unemployment, but what can policy makers do to take full advantage of emerging technologies in education while avoiding their downsides, With the objective of shedding some light on how Europe and Asia is performing in the "digital revolution " and to how strongly it is embedded both in school curricula and in teachers' education.

This connection between technology and learning is found fairly consistently however, and other studies have indicated a stronger association. The ICT Test Bed evaluation identified a link between high levels of ICT use and improved school performance. However, what this association shows is that, on average, schools with higher than average levels of ICT provision also have pupils who perform slightly higher than average. The causal link could be quite the reverse, with high performing schools more likely to be better equipped or

more prepared to invest in technology or more motivated to bring about improvement.

The experimental and quasi-experimental research studies, where gains in knowledge or understanding for groups of pupils using ICT has been compared with gains for groups learning the same content without technology, results again tend to show positive benefits for ICT. These have been reviewed using a narrative approach with consistently positive conclusions.

Overall, the challenge of assessing the impact is more acute than ever. The rise in technologies and the range of ways that they can be used in diverse educational settings across the spectrum of learners, coupled with the pace of change of technology make the task ever more demanding. The focus must shift from the technologies to the pedagogies of use, and the analysis of general impact to the specific differences that digital technologies make to teaching and learning contexts and interactions with regard to different learners. The quantity of technology use is not the key factor to student learning.

Finally this analysis suggests that the linkage may not be a simple causal one, nor necessarily a simple linear association. There may be a limit to the amount of technology which is beneficial.

II. APPROACH AND METHODS

The main approach used to evaluate the impact of technology on teaching and learning in schools has been where pupils attainment across a range of tested curriculum outcomes has been correlated with the quantity or quality of technology which was available or which they experienced in their institutions as according to (Watson, 1993; Wenglinsky, 1998; Weaver, 2000; Zhao, and Frank, 2003) are following

- Technology can be used very effectively as a short but focused intervention to improve learning, particularly when there is regular and frequent use in daily 1-2 hours over the course of about a short term like as 2-6 weeks.
- Collaborative use of technology is usually more effective than individual use, though some pupils, especially younger children, may need support in collaborating effectively.
- Remedial and tutorial use of technology can be particularly effective for lower attaining pupils or those with special educational needs.
- Technology is best used as a supplement to normal teaching rather than as a replacement for it. This suggests some caution in the way in which technology is adopted or embedded in schools.
- Training and professional development for teachers is an important component of successful approaches. At least a full day's support or on-going professional inquiry-based approaches appear the most successful. The implication is that such support should go beyond teaching skills in technology use and focus

on the effective pedagogical use of the technology to support teaching and learning aims.

III. WHAT IS META-ANALYSIS

Meta-analysis is a method of combining the findings of similar studies to provide an overall quantitative synthesis or 'pooled estimate of effect'. The results of separate interventions using technology can be combined so as to identify clearer conclusions about which interventions are effective and which factors are associated with more effective approaches.

Meta-analysis also allows an estimate to be made of the extent of the possible impact of technology on learning in terms of the effect sizes calculated. This helps to put the impact of technology in perspective, both in terms of its relative benefit, but also to identify how much more effective teaching and learning might be when supported with digital technologies. A systematic search of education databases and journals revealed 48 studies which synthesised primary research studies of the impact of technology on the attainment of school age learners (5-18 year olds). Whilst we accept this presents only a partial and retrospective view of such impact, we suggest it is the only review approach to allow a systematic comparison of a large number of studies together with an estimate of the extent of the effects on learning.

The advantages of meta-analysis over other approaches to reviewing are that it combines or 'pools' estimates from a range of studies and can therefore aggregate results to identify patterns or trends in findings over time.

It can also show whether the findings from similar studies vary more than would be predicted from their samples so that the causes of this variation can be investigated "moderator analysis". This is particularly valuable as the results from a range of smaller studies can be combined to provide answers to questions without relying on the statistical significance of each of the individual studies as this relates closely to sample size. Many small studies with moderate or low effects may not reach statistical significance and if you review the field by simply counting how many were statistically significant, you may be misled into thinking that the evidence is less conclusive than if you combine these studies into one study or meta-analysis. The statistical techniques to undertake meta-analysis form a set of transparent and replicable rules which are open to scrutiny.

Another key advantage of meta-analysis is that it helps to deal with the quantity of information in research which can overwhelm other approaches. This is particularly important when trying to draw relative inferences across different areas of education research. The number of studies available to review in any area of technology and education is extensive, so techniques to aggregate and build up knowledge to propose further research and test theories and ideas are invaluable.

Overall the key implication is that the technology is solely a catalyst for change. What is it that teachers or learners actually do which brings about any improvement in learning? Focusing on the change (and the process of change) in terms of learning is essential in supporting effective use.

This work summaries the research evidence contained in meta-analyses to identify patterns of impact in the accumulating research about the effects of technology on learning, and to identify the extent of the possible impact of technology on learning. A systematic search revealed 48 studies which synthesized primary research studies of the impact of technology on the attainment of school age learners (5-18 year olds). Whilst this presents only a partial and retrospective view of such impact, it is the only approach to allow a systematic comparison of a large number of studies with an estimate of the extent of the effects on learning.

IV. RECOMMENDATIONS

Some few valuable recommendations for improvement as impact of digital technology on teaching and learning are

1. The role of technology in learning should be identified, will it help learners gain access to learning content, to teachers or to peers, will the technology itself provide feedback or will it support more effective feedback from others.
2. The use of computer and digital technologies is usually more productive when it supports collaboration and interaction, particularly collaborative use by learners or when teachers use it to support discussion, interaction and feedback.
3. Technology should support collaboration and effective interaction for learning.
4. The use of computer and digital technologies is usually more productive when it supports collaboration and interaction, particularly collaborative use by learners or when teachers use it to support discussion, interaction and feedback.
5. Teachers and/or learners should be supported in developing their use of digital and computer technologies to ensure it improves learning.
6. Skill training is not usually sufficient to support teachers and pupils in getting the best from technology. On-going professional development and support to evaluate the impact on learning is likely to be required.
7. Identify what learners and teachers will stop doing. The use of computer and digital technologies is usually more successful as a supplement rather than as a replacement for usual teaching. It is therefore important to identify carefully what it will replace or how the technology activities will be additional to what learners would normally experience.

V. CONCLUSIONS

Studies linking provision and use of technology with attainment tend to find consistent but small positive associations with educational outcomes. However, a causal link cannot be inferred from this kind of research. It seems probable that more effective schools and teachers are more likely to use ICT and digital technologies more effectively than other schools. We need to know more about where and how it is used to greatest effect, then investigate if this information can be used help to improve learning in other contexts. the research evidence over the last 40 years about the impact of computer and digital technologies on learning consistently identifies positive benefits. The increasing variety of digital technologies and the diversity of contexts and settings in which the research has been conducted, combined with the challenges in synthesising evidence from different methodologies make it difficult to identify clear and specific implications for educational practice in school or colleges.

There is no doubt that technology engages and motivates young people. However this benefit is only an advantage for learning if the activity is effectively aligned with what is to be learned.

It is therefore the pedagogy of use of technology which is important: "the how rather than the What."

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