

Enabling and Disabling Technologies in Higher Education: A meta-Analysis of Impacts and Challenges of Limitations

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Abstract:

The higher education system now has information and communication technology as a major and imperative part of it and has influenced various facets of life to get transformed in a better way. Through these modifications, the higher educational institutions, teachers, and administration systems have broadened their audit for their capacities in future learning and teaching system. Through the introduction of new challenges, Enabling / Disabling Technologies on Higher Education have played a major role to enhance the preeminence of higher education. This review is aimed to discuss and explore the advantages of Enabling / Disabling Technologies in Higher Education in the field of higher education for the improvement and enhancement of learning and teaching strategies. In this regard, certain impacts, benefits, and perspectives related to Enabling / Disabling Technologies on Higher Education are highlighted along with the challenges and limitations it offers to the educational system.

Keywords: Enabling, disabling, higher education, challenges, and technologies.

Introduction:

To build a strong nation and society, the importance of education is inevitable as it has been empowering the nations from all standpoints. There are various effective ways through which quality of education can be improved for teaching and learning aspirations. All the technologies for the manipulation and communication of information are known as ICT which is an acronym for Information Communication Technologies (Swati Desai, 2010).

Review of the literature

ICT is always there in our daily lives in the form of radio, television, satellite, computers, mobile phone, and the internet and is being divided into two groups; one of which is the traditional group of radio, television while the second one is an innovated group which puts forward the services being offered by internet and telecommunication. However, learning

through these innovative sources of ICT is also known as e-learning. If we look closely at our world then we would realize that our whole life is being occupied by the services of ICT and in one way or another, the contemporary world is dependent upon the roles which Information and communication technology (ICT) play in capturing, storing and processing, and communicating the information. In the field of education, ICT has been enabling self-paced learning through various tools such as assignments, online quizzes, modules, and various other computer-based tools leading to more effective and productive teaching and learning enterprise. ICT has also played its part in the facilitation of transactions between producers and consumers by keeping both of them updated. Altogether it has enhanced the teacher's capacity and ability to foster the content through emails, chat sessions, etc. As a result, active learning is being promoted by ICT through the exchange of ideas and discussion.

This review aims to highlight the roles being played by ICT for the improvement of the learning system and to discuss ICT through the perspective of various authors who have researched in different fields to express the role and assistance being provided by ICT. Moreover, limitations and challenges put forward by information and communication technology are also being discussed accordingly.

As hypothesized by Bagga-Gupta et al., (2016), the democratic dimensions of Post-world war II societies and their institutions have been influenced chiefly by integration, inclusion, and apathy. Various reports have been presented by various authors on the encouragement as well as the crippling of learning in higher education through individuals and institutions in various ways, such as the use of technologies such as ICT. During the 20th and 21st centuries, innovation in the field of technology and ICT has advertised it as an authority and inquest through which promising revolution can be accessed in the field of education and societal institutions such as healthcare services and schools. And these institutes at least in the global north can be served with better opportunities.

Taking into the account apprised angle, the ethnographically framed analysis of two datasets has been focused on by the author. In which the critical disquisition has been done to explore the capacity of technology and ICT in the higher education of differently-abled individuals, along with those who have a variation on the scale of capabilities. There are mostly two ways through which the functionality as a dimension of everyday life in higher education can be done; one is the case studies on two differently-abled students in Sweden while the other is the current support services at universities in Sweden. The finding of these studies made it possible to analyze the work, accountings, and life trajectories of the institution and its members based on the time organization, space, and use of technologies.

Being near to the turn of the millennium, one can't deny the new approaches made possible by the revolution and advancement in information technology and communications technology. Though various advancements have been accepted and welcomed wholeheartedly, yet few have been embraced less cordially. However, through these advancements, unimagined progress has been witnessed in the field of teaching, learning, and research. This study was aimed to discuss the impacts of technology on higher education, with the acknowledgment of

its interdependence with opportunities and pressures residing in the system of higher education along with the wider societal context.

Five areas ;(1) Higher education and technology in modern society ;(2) Factual impact of the technology on education in ;(3) scope of the impact for coetaneous advancements in higher education; (4) legitimacy along with the wider policy pressure; and (5) defiance to a broad change in technology within higher education.

A study conducted by Chununan (2017), suggests that in terms of marketing, branding, support, and management of students learning, appropriate educational technologies have beneficial impacts in higher education institutions.

These technologies not only evolved rapidly but also improves the system altogether. Therefore, the exploration of their impact before the adoption of these technologies has always been required, to maintain sensible and competitive advantages. Moreover, current trends and impacts of emerging educational technologies have been examined chiefly. Results of these studies suggested that almost twelve emerging educational technologies can represent the current trends in development. These technologies can further be grouped into four sets that are; 1) Multiform or multibranch technologies for learning, 2) social and cordial learning technologies, 3) cloud-based learning technologies and, 4) ICT interoperability.

On the other hand, according to a study conducted through interviews with the lecturers of Thailand university suggested seven emerging educational technologies were suggested as current trends and that have a profound impact not only in present but also in near future., these are; 1) Repositories of open learning source, 2) Platforms of social learning, 3) cloud email, 4) EMNS, 5) learning stack, 6) collaboration technologies and unified communication, and 7) student retention CRM. Moreover, it was suggested that these emerging technologies would be needing more development to suit the current work of those lecturers and that these emerging technologies were found to be appropriate in terms of project budgets, time constraints, and manpower for the context of Thai universities.

Higher education reform strategies have been linked to the concept of globalization by various governments worldwide. And that's because the term globalization indicates the variety of developments such as intense and rapid integration of national and international economies, along with the acceleration in the development of information technology and post-Fordist work practices (Castells, 1996; Waters, 1995).

A new type of economy named the knowledge economy is also a product of these developments. The trend of material products and manual work in developing countries has been signaled away through this economy. Despite the certain debate over the exact meaning of globalization (see, for example, held *et al.*, 1999; Hirst and Thompson, 1996), the capability to engage in a contest with high-quality standards, products, and services is dependent upon the scientific and technological knowledge along with ceaseless coinage and innovation.

In the light of context explained above, higher education has always been considered to play a critical role in the yielding, disbandment as well as the alienation of the knowledge being produced through economic innovation, and technology. (Carnoy, 1994).

To harness public universities in a way to enhance economic productivity and to locate higher education as one of the most important global commodities, certain reforms were attempted by the government. And this review chiefly highlights implications concerning education, economy, socio-political situation and focuses on the impact of certain forces for commodification on universities. It's important to mention that the beginning of this whole process in one way or another depends upon a few outlines that explain the governance framework as well as the funding required for it. This in turn develops new ways to bring about the functioning of these frameworks in higher education that is more responsive to market forces as well as intervention by the government. It is also important to mention three key factors through which the analyses of higher education are being executed, these areas are; access to knowledge, reproduction of the knowledge, and the production of knowledge.

Moreover, the author concludes that the argument upon the development of certain challenges isn't be denied as the field of the sociology of education has neglected higher education as a site of inquiry to some extent. And that's why a future perspective regarding the sociology of education and its outline is required.

As reported by Sanders (2012), technology has always played an important role in the enhancement of learning along with the support which it provides to the delivery of curriculum in various ways, and that's why its availability, as well as the range which it puts forward, is need of the time. It's important to mention that learners always showed eagerness to use technology as a way through which they can enhance their learning. To meet learners' expectations and to maximize the learning opportunities, not only the development of information but also proficient literacy skills are required. In this regard, a variety of mobile devices and virtual learning environments can play a vital role in the delivery of potential knowledge as they provide learners with the opportunity of creating their own personalized and immersive learning experiences which in turn, certainly have relevancy with future professional practices. Here, the role of tutors can't be denied as they are the sources of support and guidance for learners to use technology effectively. Moreover, further research is necessary to support the impact of learning in many other cases.

For two decades, Chai et al., (2014), have been reflecting upon the efforts of ICT integration and major frameworks that have been focused to produce alertness about the ICT integration along with the challenges for revelatory difference among educators of all levels in today's society. A theoretical frame was proposed in the form of a protracted interpretation of the technological pedagogical content knowledge to effectuate substitutive knowledge and ingenious patterns for ICT integration in educational settings.

Through the contribution to the expansion of serviceable capabilities, the orientation of novel knowledge, and the production of defendable awareness, a vital role has been played by universities in acclimating the world's future. It is evident that for decades, universities have been undertaking the steps and activities for the implementation of Higher Education for Sustainable Development (HESD).

Moreover, many questions have been raised by many of them regarding the most appropriate and sustainable way for the development and in this regard, various approaches have been used

to select the sustainability key competencies. However, international agreement in this debate of the most important key competencies is still less than its requirement and role. As a result, it kept the authors searching for the crucial key competencies that individually can help to understand the central challenges that are being faced by world society and that can facilitate the development of the world toward a future more sustainable. Hence, the identification of these competencies can be fostered through university teaching and learning. Selected European (Germany, Great Britain) and Latin American (Chile, Ecuador, Mexico) experts also identified 'sustainability key competencies' through an empirically designed study, eventually making it a Delphi study. However, the results obtained through these studies indicated the twelve key competencies out of which the most important are those which help in systemic thinking, critical thinking, and anticipatory thinking. As a whole, all of them are crucial for sustainable development Rieckmann (2012).

According to the statement by El-Mowafy et al., (2013), the enhancement of education requires the development of a blended learning approach. With that, they reported that this learning strategy was firstly investigated based on various reviews of surveying courses such as analysis of the content which it has, national and international surveys of key stakeholders as well as benchmarking with universities. Further investigations also revealed methods and tools of blended learning. These tools are coupled with ever-evolving technical skills as well as learning theory principles. Learning management systems, collaborative learning, e-learning based upon simulation and peer-assessment are a few of the crucial technical skills.

However, two blended learning tools were very well presented in the terms of surveying units. The first tool is specified for the surveying through an online interactive virtual simulation. While the second tool is based upon the module of e-assessment digital marking, moderation, and feedback. The survey commenced for students indicated the improvement of students' understanding and learning of required tasks. Moreover, it was learned that students found the e-assessment tool more helpful for the improvement of their performances as it helped them to keep their goals and objectives focused in each activity. Peer e-assessment on the other hand also found to play a significant role in the improvement of student learning. The whole study was concluded through the discussion on generic skills developed through authentic learning in surveying education.

The time we live in is changing every day and global society is increasing through the rapidly evolving ICT technologies along with the generation of other new knowledge. The ever-increasing human population is now has become a threat to global sustainability.

In this challenging time, a way to new premium on technological workforce skills has been put forward by the knowledge-driven economy in the form of out-sourcing and off-shoring. Moreover, increasing confidence has also been placed by the government chiefly in market forces which reflects the public priorities as open-source software and knowledge and learning.

No doubt, the great disparity in the wealth and power of the globe has shifted the geopolitical tension and manifested the current threat to homeland security due to terrorism. Yet unusual opportunism and optimum technologies didn't only bring about improvement of human conditions but also enabled the circumstances of creation and flourishing of new social

institutions and communities that are more advanced and capable of expressing the need of our society. The issues mentioned above as a whole can be considered as a source of the context for higher education in the 21st century (Duderstadt, J.2007).

Electronic technology has been penetrating every aspect and area of the social and cultural lives of people. For example, television as an initiator broadcasted images and forwarded an immediate and powerful way to express and experience ideas and information. Moreover, it helped in rediscovering and recasting the direct experience and liberated the world from texts and static illusions. The intact vividness and intensity of television didn't only provide entertainment but also made it possible to broadcast events world away from homes.

Computers, on the other hand, made information instantly available and modified no matter if it's an airline reservation or contents from encyclopedias. Texts have become permanently flexible because through computers they can be changed instantly and printers can print them out right away. It is evident that barely for 20 years nature didn't only change but also the demand for workers who have skills to operate and work according to the modern technology has been increased, chiefly in the field of business and education which previously didn't need any formal use of computers and technology.

As a whole, it is easy to understand the importance and value of technology and how it has revolutionized Americans and other cultures. Not only the business sector but also the education sectors are rushing to catch up (Strommen, and Lincoln, 1992).

With the ceaseless pressure and disorderly forces of the market upon the natural resources, mankind is on the threshold of a grievous era propelling the dominant states to conflicts that are increasing with dangerous speed. Here it is important to understand the roles of research in higher education and its contribution to human and social development and that's why a good balance between basic functions of research is required to avoid risks. However, focusing on the transformative function of research isn't enough as it may lead to the delay of economic benefits and reactive approaches may be generated due to unilateral concentration. Moreover, the concentration on short-term issues isn't good enough for the future generation to achieve long-term goals.

That's why there should be the reinforcement of research networks between rich and poor, southern and northern, and developed and less developed countries and systems to solve the problems by bridging the gaps between knowledge, its consumers, and producers (Vessuri,2008).

Many exciting applications of information technology in schools validate that new technology-based models of teaching and learning have the power to dramatically improve educational outcomes. The validation of new technology models of teaching and learning through existing applications of information technology has empowered educational outcomes. And eventually, the interest of people has been increased regarding balancing. As a result, many people are asking how to scale up the scattered, successful "islands of innovation" instructional technology that has empowered universal improvements in schooling enabled by major shifts in standard educational practices.

Policies and practices are required for undertaking the systemic sustained, large-scale, simultaneous innovation in curriculum, schools, business, home, and community. But these policies are different than those policies which foster the projects of small-scale education and its improvement. To free up the money for innovation, the movement from utilizing special, external resources to the reconfiguration of the existing budgets is undertaken chiefly through systemic reforms.

Two big challenges are always confronted by the teachers during the learning of new technologies as teachers are most familiar with those technologies that aren't much known to them. One of them is the integration of these technologies in the teaching and learning process while the second is the roadmap that should be followed to engage these technologies in a content-oriented way for the improvement and activation of the learning settings.

As reported by various authors, the attitudes of educators play an important part in the successful implementation enabling, and disabling of educational technologies (Albirini 2006; Mahdizadeh *et al.* 2008; Al-Zaidiyeen *et al.* 2010; Krishnakumar and Rajesh Kumar 2011; Babic 2012).

According to a study done at the University of Zehrab to learn about the attitude of teachers towards the impact of e-learning, it was found out teachers have an optimistic approach towards the permanent and reliable organized support provided by e-learning. Moreover, the teacher finds e-learning more helpful to meet the needs of today's student's collaborative learning and achievement of learning outcomes become more prominent and obvious and it became easy to manage the knowledge according to its demands and need.

Here it is important to mention that the attitude of teachers and their perspective toward e-learning has also influenced the study and learning, a few of them also shared their views that were contrary to what was expected, as they thought that e-learning is also increasing work for teachers and the role of teachers in the educational process is being underestimated and that's why it has a negative impact of teaching and learning.

Enabling and Disruptive technology in higher education key terms

Enabling technology

1. Enabling technology
2. Computer-assisted learning
3. Networked learning
4. Transformative learning
5. Change management

Disruptive technology

1. Personal computing disrupted,
2. Laptop computer and mobile computing
3. Smartphones
4. Cloud computing
5. Social networking

6. Disruptive innovation
7. Information Technology Transformation
8. Business innovation
9. Information Technology Innovation
10. Digital disruption,
11. Disruptive Technology
12. Enhanced Learning
13. E-Learning
14. Technology infrastructure
15. MOOCs
16. Information Computer Technology
17. Digitalization,
18. Internet
19. Artificial Intelligence
20. 3D Printing
21. Robotics
22. Facebook
23. Massification of learning
24. Augmented Reality (AR)
25. Virtual Reality (VR)

Objectives of the study

- To synthesize the concepts associated with the meanings of ICT
- To categorize impacts of enabling and disabling technology in education
- To evaluate the challenges of limitation of enabling and disabling technology

Research Questions

- What are concepts associated with the meanings of ICT?
- What are the major areas of impacts of enabling and disabling technology in education?
- What are the challenges of the limitation of enabling and disabling technology?

Methodology of the study

- Qualitative paradigm
- Homogenous sampling technique
- 62 articles related to Enabling and disabling technology
- Spradley semantic relationship taxonomy for thematic analysis.

Challenge

- The exploration of impacts before the adoption of these technologies has always been required, to maintain sensible and competitive advantages.
- Results of these studies suggested that almost twelve emerging educational technologies can represent the current trends in development.
- These emerging technologies would be needing more development to suit the current work of those lecturers and these emerging technologies were found to be appropriate in terms of project budgets, time constraints, and manpower. (Chununan, 2017)
- To meet learners' expectations and to maximize the learning opportunities, not only the development of information but also proficient literacy skills are required.
- Two big challenges are always confronted by the teachers during the learning of new technologies.
- One of them is the integration of these technologies in the teaching and learning process while the second is the roadmap that should be followed to engage these technologies in a content-oriented way for the improvement and activation of the learning settings.
- Attitudes of educators play an important part in the successful implementation and enabling and disabling of educational technologies (Albirini 2006; Mahdizadeh *et al.* 2008; Al-Zaidiyeen *et al.* 2010; Krishnakumar and Rajesh Kumar 2011; Babic 2012).

Findings:

- Encouragement as well as the crippling of learning in higher education using technologies such as ICT. (Bagga-Gupta et al., (2016)
- Learners showed eagerness to use technology as a way through which they can enhance their learning. (Sanders 2012),
- Students found the e-assessment tool more helpful for the improvement of their performances as it helped them to keep their goals and objectives focused in each activity. (El-Mowafy et al., 2013),
- Two blended learning aspects evolved rapidly interactive virtual simulation.
- E-assessment digital marking, moderation, and feedback.
- Improvement of students' understanding and learning of required tasks.
- Technology broadly impacted Learning management systems, collaborative learning, e-learning based upon simulation.
- Many exciting applications of information technology in schools validate that new technology-based models of teaching and learning have the power to dramatically improve educational outcomes.

- The validation of new technology models of teaching and learning through existing applications of information technology has empowered educational outcomes. (El-Mowafy et al.,2013)
- The technologies featured in the survey were a mixture of the established (e.g., Facebook) and the emergent (e.g., Wall wisher), to obtain a sense of the extent to which different technologies were being used.
- The technologies specified in the survey were informed by the Horizon Report 2010 (Johnson et al, 2010), which argued for the importance of social networking technologies, as well as formal, institutional learning technologies.
- The Horizon Report also identified the emergence of newer tools enabling collaboration. These types of technologies (e.g., Twitter and LinkedIn) were featured in the survey, alongside established technologies for learning and teaching.

Conclusion

Through the coverage of various aspects of life, information communication technologies play an important role in education. It helps not only to enhance the effectiveness of the teaching and learning process but also motivate the learners to come forward and adapt themselves to the environment being provided by ICT. Various skill sets being offered by ICT didn't only improve the education but also assisted teachers and peers to enhance their potential and expertise. Teachers specifically found ICT as a route that aids them to logically and successfully convey dynamic and effective education to students. As a whole, ICT and its applications can be considered as a way to increase the learning of students, as a key to solving modern world problems as well as the base through which one can build his career success in today's competitive and technological world.

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