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Digital Transformation in e-Learning Education

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Abstract. The development of online learning platforms has been taking place for some time now. However, the rapid increase of online learning and teaching has taken place in 2020, during the COVID-19. Many platforms already had in place their concepts and needed tools. The instructions for the usage of platforms by teachers and users (students) presented a challenge due to the short introduction and application of self-teaching system, therefore often becoming a real challenge. Rapid transformation from a traditional format into a digital system leaves many areas to be considered for more critical evaluation in terms of educational students' achievement. This paper analyses current trends of transformation, e-learning potential, application, and specific platforms growth. Another issue that this paper addresses is the Artificial Intelligence for sustainable development in education. This study is based on secondary data reviewing current trending scholarly work as well as other credible sources of information to obtain related information.

Keywords: Digital, marketing, trends, adoption, business, Artificial, Intelligence, platforms

1 Introduction

The application of online learning concepts emerged as the internet kicked in. Earlier studies by Higher Education Institutions experts have discussed the technological changes and responses to the developments of new innovative approaches “teaching in higher education in 2015, and beyond, requires a new approach because of changes in the economy and changes in technology” (Bates, 2015). In the trend of where and when to teach, the flexibility of growing needs for an individual and wider aspect of internationalization, a higher needed degree of flexibility is a need in higher education and can be characterized as complex flexible and dual learning (Wim Jochems Jeroen van Morrienboer Rob Koper, 2004). The emergence of developing an education system that is less dependent on time (when to take place) is mainly related to the people that combine their work time with study time to help them maintain and better prepare for their jobs, career improvement and personal growth (Wim Jochems Jeroen van Morrienboer Rob Koper, 2004). The important aspect is given the flexibility for on-demand services and products “demand-oriented” (Wim Jochems Jeroen van Morrienboer Rob Koper, 2004). According to (Wim Jochems Jeroen van Morrienboer Rob Koper, 2004) they fully believed back then that e-learning will play a bigger role in the future to enable facilitation of learning in a distanced manner but through some certain critical conditions to be met and Information and Communications Technology (ICT) capabilities will further improve and help innovation in the education system. According Wim et al., “Three components for successful e-learning have to be

taken into account: Pedagogical, Technical as well as Organizational aspects” (Wim Jochems Jeroen van Morrienboer Rob Koper, 2004).

Objectives of this research are:

1. What is the current trend in the digital transformation of education?
2. What are e-learning market growth and potentials?
3. A critical review of rapid application of e-learning during COVID-19?

2 Literature review

The growth, innovation and the evolution of the internet age are considered a new era of modern information society and education is the source of providing competitive advantages for socio and economic growth (Kilic et al., 2015; Viliavin, 2020). Many external factors are driving the need for new systems and adopting new models for traditional universities as the growth of world education providers is increasing every year through new types such as virtual universities, for-profit universities managing their teaching process differently, therefore, creating competition especially for the traditional universities (Wende, 2017).

As the globe is being more connected through ICT means Wende explains as following “The process of globalization, characterized by increasing global economic interdependence and international competition, leads to the emergence of an international higher education market in which a growing number of traditional and new types of higher education providers compete with each other” (Wende, 2017).

Another dimension about the education is presented by Drohan et al., “Blended Learning has traditionally been seen as a popular choice in the pursuit of educating the masses in an ever-increasing digital world” (Drohan, Delestar and Seeling, 2020).

In the past, online platforms have been utilized at select universities, various training centers, and often at countries during emergencies such as earthquakes, including non-formal education. The growing trend of online communication platforms has been growing over the years and they may shape the future of education; the following are some of these platforms being used and the list is not all-inclusive: Zoom, Webex, Teams, Slack, Udemy, start.me, Neo, Ted-Ed, Coursera, Google Classroom, Bakpax, Pronto, Skillshare, Edmodo, Blackboard Learn, Parlay, WeVideo, WizIQ, Flipgrid, Adobe, Seesaw, GoGuardian, G Suite, Otus, Articulate 360, Floop, Future Learn, Hapara, Shift, Lectora Inspire, Kialo Edu, Buncee, Asana, LanSchool (Lokanath Mishra, Tushar Gupta, 2020).

Almost all existing Learning Management Systems (LMS) implement online education standards in one way or another. Some of the main organizations that are involved in the process of developing specifications and others supporting creation and adoption of tools for learning objects are the following: International Organization for Standardization (ISO), American National Standards Institute, Institute of Electrical Electronics Engineering (IEEE), DCMI, IMS/ GLC, W3C, they have been working to establish protocols and standards in terms of managing metadata (Viliavin, 2020). As ICT is taking a bigger role in the education sphere and new software tools becoming necessary to operate within the online format the need to introduce new standards for online and virtual classes is becoming necessary (Viliavin, 2020). When we

refer to the standards, privacy and security as the users and platforms increase so do the attacks and vulnerability increases. In this case, we are going to show some basic statistics and trends growth for some platforms and their potential that may be utilized for educational purposes, training, businesses, etc.

According to the ARC report, the “Global E-Learning market is expected to grow from \$176.12 billion in 2017 to reach \$398.15 billion by 2026 with a CAGR of 9.5%” (Pande, 2021). Some of the basic key factors having a positive impact in growth and use are such as the possibility of flexibility in learning, lower costs, accessibility, virtual environment learning, and the ability to use various online capabilities such as laptops, desktops, phones, tablets etc., however, other factors may have a set-back such as change management, lack of latest technology, partnerships are some of the issues that may hinder the growth of this market (Pande, 2021).



Fig. 1. Percentage growth in collaboration tools, 17th Feb to 14th June 2020 (TechRepublic, 2020)

The Zoom maintained its growth with some declines however its competitor Teams has had a consistent growth surpassing Zoom. Other competitors had maintained their clients however Skype didn't make a significant jump as other competitors did (Zoom, Teams, Webex, go to meeting some declines while slack maintained steady client numbers). In the last decades, the trending needs for education are growing, therefore, diversifying the need for additional infrastructure and higher education institutions. According to Wende, in some parts of the world, there is a need to open up a new university weekly (Wende, 2017). Considering the above, adding new ICT infrastructure is enabling competitors to add contemporary study programs within and outside globally recognized thus increasing more access to education for those unable due to jobs, time, place, travel, etc. While the online platforms are enabling students to access their lectures challenges are evident in maintaining a connection between teacher and students.

The rapid initiation of online learning took place there were some difficulties noted in the implementation of a large scale e-learning model that arise during the COVID-19 (Lokanath Mishra, Tushar Gupta, 2020). The need to provide special online assistance to improved teacher's instructions would facilitate the learning process for many kids as class failures have skyrocketed and especially in math (Erin Richards, 2020). According to Margaret Reymond, there is a significant gap in learning losses and may take years to recover and it is accounted for half the year of learning and reading for the most schools observed in the US (Margaret Reymond, 2020). The results are worrisome and the need for teacher quality instructions adopting improvement in new approaches to further increase student attractions and involvement is critical and student assessment levels are needed continuously (Margaret Reymond, 2020). As explained by May Lim, the consistency as whole university support is a must in terms of preparations for staff, students, licensing,

accessibility, schedules, etc. (May Lim, 2020). According to Wim et al., student-centered should be provided with clear instructions in personalized levels and different delivery modes, and so on (Wim Jochems Jeroen van Morrienboer Rob Koper, 2004).

New trends in Artificial Intelligence (AI) are predicted to shape the future of education and providing many opportunities. A report from UNESCO cites: “Artificial Intelligence is a booming technological domain capable of altering every aspect of our social interactions” (UNESCO, 2019). According to UNESCO Report (UNESCO, 2019), future implementation of AI technology can help education systems use data to improve educational equity and quality, especially in the developing world. While there are challenges such as equity and inclusion some of the specific expectations are as following:

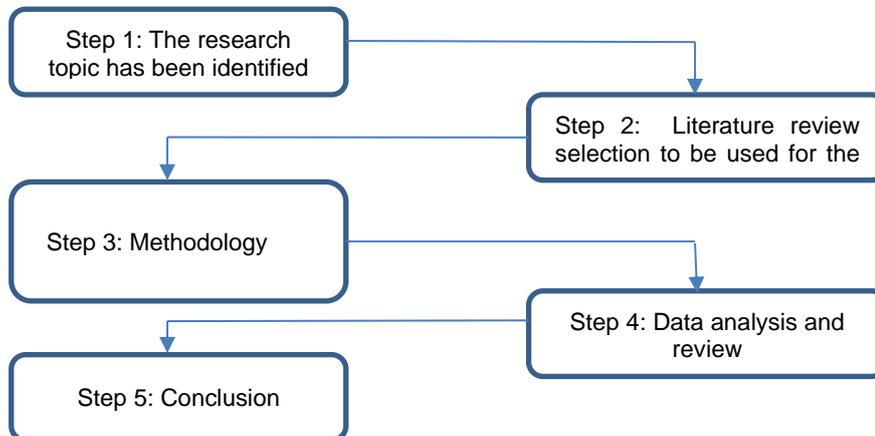
- Promotion of personalization, accesses to education, collaborative environment, intelligent tutoring enabled technologies and overall better learning outcomes;
- Management of large-scale education system through data analytics of data available from schools and learning/teaching experience;
- To prepare learners and teachers live and thrive with AI to create solutions for sustainability and actual life environments.

3 Methodology

The focus of this study is to analyze the digital transformation of education around the world. The cost-effective method and ability to get an insight through secondary research is believed to provide the best answers to this study. Availability of data by different universities, education systems, government data and organizations and institutes will provide knowledge of the past decades, current and future trending. Due to the nature of the study, secondary data sources are referred to, obtained from various sources to assist with the conclusion for this study. Secondary method selection was also based on that besides it is faster and less costly also it is feasible to see the trends worldwide and compare different data and opinions. Secondary sources are considered data that’s already in existence, therefore extensive research-based was performed by acquiring data at various sources such as:

1. Online data resources: a cost-effective way of utilizing existing available data makes it the most convenient method. A downside is that these sources have to be trusted with credibility what they provide and users must be careful as that may compromise the study;
2. Digital libraries: while the digital transformation of education is very new there is always a need for updates in trends often presents a challenge in this area since while we are writing this paper there are changes in trends;
3. ICT Tech Institutes: trusted institutes around the world keep monitoring trends changes and often have yearly reports on trends in ICT trends updates;
4. Commercial sources: such as magazines, interviews provide valuable information are excellent resources for secondary data collection;
5. Universities: a scholarly work will provide the most answers for this study.

The steps in conducting this research have been laid out in the following format:



4 Conclusion

The availability of ICT will continue to drive the further digitalization and transformation of the education sector. Education providers that have pioneered maintaining their updated inventory of ICT equipment and Human Resources will continue to provide and grow their teaching potential as long as they maintain updated in tech trending. Also, practical approaches to maintain preparation with instructions and student-centered approaches will certainly yield long-term benefits and increased quality and their ability to provide regional or global education as education market value is increasing and the need for providers to match the needs of new graduates will continue.

While there are many positive facts that e-learning was rapidly implemented during COVID-19, left many unanswered questions such as level of true student achievement with some reports seriously doubting the student achievement where some reports indicate as less as 50% goal reach. The learning platforms had a booming reach and showed that ICT tools will be part of the new learning method or potentially a mixture that will easily blend now and in the future.

Artificial Intelligence application in the education system shall shape this sector further in data analytics and teaching to provide sustainable development while there may be a growing gap for those unable to yield the benefits of the AI due to lack of technological means. Despite reviewing a significant number of articles, online sources, research centers, and other data through scholarly work, this research shows that it is difficult to predict and provide real assessment and future of the e-learning.

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