

# Big Data and E-Learning in Education

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## Summary

The aim of this paper is to present revolutionizing education through e-learning and big data. In the olden times, when technology has not progressed far enough, there is only one type of teaching and learning that was known: a chalk and blackboard, with the teacher and student being the main factor. Now, as in the 21<sup>st</sup> century, teaching can be taught without a teacher and learning can be done in various ways, either we are connected to the Internet or not, and also have the drive to strive for that certain knowledge. E-learning is referred to the delivery of learning, training or education via electronic means. It happened because of the revolutionizing of technology and increased in standard of living. The technology includes many types of mass media, for example photos, voice, animation and many more. This application will react efficiently with the connection of the Internet. In addition, e-learning can occur inside or outside the classroom. In fact, people nowadays use e-learning as distance learning or blended learning, which blended learning means the use of technology during face-to-face interaction.

## Key words:

*education, blended learning, student, big data, e-learning*

## 1. Introduction

As a student living in the 21st century, one particular item has become an important life prerequisite to survive college and university. It has the ability to further enhance the communication between lecturers and students. This item is none other than electronic mobile devices. The reason as to why it has become an important life prerequisite varies. One reason being it is important in making mobile and e-learning a success. Mobile learning is the process of obtaining and understanding knowledge via mobile personal electronic devices, such as mobile phones, laptops, tablets and mp3 players. Mobile learning not only saves the environment but also rewards its users with an enhanced learning experience, yet also inducing several affects on one's school and life balance. Transiting from traditional classroom learning to online and mobile learning, it certainly will benefit the environment. For example, the production of textbooks will surely decrease and this means that cutting trees for paper products and

school stationaries will lessen. Trees are saved and given more years to live to cleanse the air off carbon dioxide emitted by activities involved in producing and transporting books across the world. Even though the matter of mobile learning is rarely associated with saving the mother earth, it definitely does play a major role in reducing global warming. Moreover a handful of students would agree that carrying textbooks, regardless of its size and number of pages, is too much of a hassle. E-books which can be accessed on laptops, tablets and mobile phones, would be a more popular choice among students nowadays. The rest of the paper is organized as follows: the benefits and limitations of e-learning is presented in section 2, section 3 gives the strength and weakness of e-learning, e-learning in universities is presented in section 4, Big Data in education is presented in section 5, finally section 6 gives conclusion.

## 2. The Benefits and Limitations of E-Learning

For years, the delivery of education has advanced from books to e-learning and e-learning has become a thread in all parts of the world. E-learning, which are also called online education, is basically a modern method of communication and it is implemented in schools, institutes and universities to make the distribution of information source easier. They are delivered through the medium of the World Wide Web where educational materials are made accessible and learners can interact with those materials with the use of mails and online discussion group[1]. There is a universal agreement that e-learning market will have a fast and significant growth over the years. There are many benefits and limitations of e-learning. This section will discuss two benefits and two limitation of learning online.

One of the benefits of e-learning is that e-learning is environmentally friendly reduces waste and consumption of papers thus saving trees from being cut down. In this 21st century, many organization and educational institutions have rejoiced at the opportunity to save cost to print papers. As e-learning becomes more popular, it saves people from travelling for a training session outside the country; it saves time and also reduce costs for travelling.

There are a huge number of aircraft in the world; approximately 16 thousand. These aircrafts produce more than 600 million tons of carbon dioxide annually, which is as much as the entire African continent. E-learning benefits the environment by reducing waste and consumption where it eliminates paper usage as paper manufacturing is actually the third largest user of fossil fuel worldwide and cutting down the use of office paper by 10 percent, United States can prevent the huge emission of greenhouse gases which is corresponding of taking 280 thousand cars off the road. Most schools, university, institutions and organizations are trying to become eco-friendly by introducing methods to reduce the use of papers.

The second benefit is that it is convenient to not only students and teachers but also to employees and employers. E-learning and training can be accessed from anywhere and allow employees to work from home thus boosts staffs' productivity and engagement. With the help of e-learning, it is cost-effective for employers because they do not need to rent offices as their employees can work from home and also cut down the costs of guest speakers and travel arrangements. Similarly e-learning is time efficient as it promotes scalability because training can be provided worldwide to a large number of trainees and it can avoid scheduling conflicts and the search of availability of date for all staff to be free. Moreover it is an effective learning whereby websites that offer e-learning can be revisited easily and offers social interactions with other users such as chats and discussion boards.

E-learning in spite of the benefits, also has some limitations. The limitations are computer literacy and access to equipment and Internet connection. To adapt on learning online, learners and instructors need basic equipment such as a computer or a laptop and have basic computer knowledge thus those who does not posses these skills will have a problem. Some users might not feel comfortable using computer and others with low income will have a problem as they do not have the equipment to do e-learning. Internet connection is also the major limitation for people who use e-learning. With poor connection, people will have difficulties to access all the e-learning websites. It is crucial to consider the technology requirements and issues upfront before even implementing an e-learning system. This affects the learners in the way that it increases learning time and decreases learning motivation. For example, in a university, if the Internet connection is being used by many people, it may result to a slow connection where it tends to irritate some people and as a result they might stop working on what they were doing. Some learners might not be able to work on their laptop at home as they do not have Internet access.

E-learning has advanced to the point where it has become a very important element in many universities, institutions and organizations because it provides

alternative to traditional education or work[2]. The benefits of e-learning are it is convenient, reduces costs and it is ecofriendly. There are also challenges for implementing e-learning such as limited computer skills and equipment and also access to the Internet. However those limitations can be overcome. All universities and institutions have provided equipment for learning such as computers and have Internet access where those who could not afford a laptop can use thus they can work on their assignments, projects and research there. Those learners and instructors with limited computer literacy skills can be given training or self-training. However, we cannot excessively depend on e-learning only; blended learning is also vital where it involves web interactions and also the traditional face-to-face interactions[3, 4, 5].

### 3. The Strength and Weakness of E-learning

E-learning, which sometimes referred as online learning, is a form of distance education where information is delivered via the Internet and is needed to be accessed from a computer. E-learning is popular in these modern days compared to traditional class learning[6, 7, 8, 9]. Some may see e-learning as beneficial compare to classroom learning and some see as non-beneficial. This section will discussed the strength of e-learning such as flexibility and helps one to participate and also its weaknesses, such as there is no proper contact with the teachers and information overload.

One of the advantages of e-learning is the flexibility. Online classes gives people the chance to be flexible as it means that there is no schedule, location and distance. Hence, it is an advantage and not an issue to people who have commitments as it can help them to balance commitments, for example family and work commitments. The thought of not missing a class, like a traditional classroom learning, will not exist due to the amount of flexibility in an online class. The main benefit of e-learning is saving travel time, given that students do not have to travel to and from a home campus. The option of traveling from home to campus make it easier for teachers and students to fit into their schedule. Students or teachers can choose place or time to deliver or receive the information according to how they want and suitable for them. Therefore, flexibility encourage not only, students but also teachers to use e-learning.

E-learning can help students to participate more in discussion. E-learning can help eliminate a potential participation hinder which includes fear of talking to other classmates and teachers. This may be because students are not only required to talk and ask in a forum or email as they are not in a classroom setting where people will have a face-to-face interaction. Most communication in e-learning is carried out by commenting and typing in the

comment bar, forum or email. Hence, this encourage students to be comfortable to interact and exchange thoughts and opinions with teachers and students. Students tend to be enthusiastic about e-learning or e-learning due to the distance and not being in campus population. As a result, students who are from online class compare to students from real classroom. Therefore, the fear of participation in e-learning will be fewer as no face to face interaction and discussing are needed.

Eventhough e-learning does bring advantages to the teachers and students, it can be discussed that e-learning has its own disadvantages and one of them is the proper interaction with teachers and peer. E-learning produces "monologue and not real dialogue." This means an online environment may not be effective as the communication deal can be dull to some due to no real interaction. Students who enroll in e-learning communicate teachers and students from different sources, for example, email, forums and chats, which differs from a traditional classroom learning environment. These can guide and clarify students from online courses however this kind of communication key through e-learning may be difficult to some as e-learning may not provide the proper encouragement and resources compare to face-to-face interactions. Some may be discourage and confused during the form of communication which may led to miscommunication between one and another. The opportunity of interaction is available but it does not received the same kind of communication complexity when being compare to traditional classroom learning. Thus, it does bring trouble to those who needs a proper communication interaction.

The last weakness of e-learning is the possible chances of information overload. Information overload is when one received a large amount of data presence and this will bring difficulty and also affect the student's learning experience. This may not occur to all kinds of style like video and audio but will occur with some kind of e-learning styles, for example e-text. E-learning style like e-text will require students to discover relevant points and important references. With the amount of data presented in an in text, students may be disbelief and this may cause them to have a difficult time to consume the amount of information presented due to information overload. Contributing factors, for example discomfort online communication, and difficulty understanding e-text, increase information overload. Hence, information overload in e-learning will not bring benefits students.

#### **4. E-learning in Universities**

Today, alongside of the advancement of technology, e-learning which also known as online learning is another new learning tool introduced. E-learning is referred to the

delivery of learning, training or education via electronic means. It happened because of the revolutionizing of technology and increased in standard of living. The technology includes many types of mass media, for example photos, voice, animation and many more. This application will react efficiently with the connection of the Internet. In addition, e-learning can occur inside or outside the classroom. In fact, people nowadays use e-learning as distance learning or blended learning, which blended learning means the use of technology during face-to-face interaction. Our lives are being dominated by technology where we all are connected 24/7 on the Internet, as well as the use of smart phones. Smart phone and e-learning are co-related, thus creating mobile learning or known as M-learning. M-learning is used on devices like smart phones, tables or any type of gadgets.

In the modern society, individual prefer e-learning comparing to traditional learning. The use of technology has influenced the way of learning. It has made e-learning more interactive and efficient. E-learning includes advantages that cannot be found in traditional learning, such as the ability of conducting online discussion, easier access for information research, accessible for online notes or lecture. For example, in some universities, they have implemented an access to e-learning that is known as "Canvas". In Canvas, lecturers and students are accessible to use this website. It is very convenient for online discussion, posting up lecture notes, turning in assignments, grading up assignment, having quizzes, online lecture and many more. Canvas is also accessible on mobile phones or any tablets. As long as there is Wi-Fi, and connected to the Internet, this is when we can be connected to Canvas. As well as with the use of social media, peers can stay connected with others, for example, Facebook allowing them to share exciting and fun in collaborating doing projects or having a small forum.

E-learning also act as tool for businesses to have better development strategies in maintaining good services. E-learning is a relevant way for organizations to reduce their carbon footprint. Businesses can create an online database to key in their customers' details. Employees can just search by the name of the customer's and the details will be popped out. Moreover, this can save the time from searching manually on paper and at the same time, the company can go green by saving papers. Another key to the advantages of e-learning is the low cost, where the company can save budget by hiring a professional accountant or send their employees overseas for training. The employees themselves can access training through e-learning at their perspective home. They can fit their training session during their free time. Hence they can be self motivated by doing their works independently as they will take more advantages in searching for sources.

## 5. Big Data in Education

As the new age of innovations and models made to gigantic measures of information on consistently over the web by empowering high-speed catch, huge information has started disclosure and investigation intended to extricate an incentive from substantial volumes of a wide assortment of data[10, 11]. In picking up a knowledge from various sources as a key part to keeping up an upper hand like numerous business situations, enormous information with the capacity to investigate information and comprehend students' conduct is utilized as a part of ongoing to offer customized and tweaked administrations. Towards the assortment of settings of information ability to find bits of knowledge about the administrations procedures, students, or even rivals in private segments, huge information hones happen with more imperative factor to consider huge information in the instructive setting to pick up its value[12]. By giving new chances to augment the capability of information accumulation in connection to web based learning systems, and furthermore inventive teaching, the idea of enormous information with these open doors from the point of view of the two understudies and specialist co-ops including colleges, establishments, government divisions, and approach creators, empowers to offer such customization and personalization of information and administrations with more exact for every student.

## 6. Conclusion

In conclusion, as we all are excited with the technology in education is developing by having more opportunities in finding resources, it will also be a great shame if our excitement can cause neglecting and lose the value in traditional education teaching that has been built up by teachers over the past decades. Hence, we need to maintain equally on having traditional revolutionizing education through technology. However, it must be emphasized that an individual should only spend an appropriate amount of time on their devices and schoolwork. One can start by only doing school work on school week and spend the weekend spending leisure time with family and friends.

Lastly, it can be concluded that, as the world becomes more modernized and developed, the use of e-learning will perhaps be popular and improved by the next years compare to today. However, due to the limited progress of e-learning, it can be argued that e-learning have its own strengths, for instance, flexibility and help communicating, and weaknesses, such as no proper interaction and information overload. Perhaps in selecting a proper way to receive and deliver information then the some issues with e-learning will not occurred. Nevertheless, it is the

student's and teacher's choice to select a proper learning environment, for instance, e-learning, traditional classroom learning or blend learning, which is suitable for them. Thus, depending on the people's choice, e-learning will either continue to expand or have the same progress from today. The idea of encouraging universities to have e-learning and mobile learning can depend on whether the students can be self-motivated, and not misuse the devices apart from using it for research and work.

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