An Investigation of the Advantages and Disadvantages of Online Education

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To my beloved brother

Ahmed Saleh Alshamrani

الشهيد البطل أحمد بن صالح الشمراني- رحمه الله
1994 – 2017

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signed

Mohammed Alshamrani

Date   30/January/2019

Abstract

This study had the primary objective of identifying the advantages and disadvantages of online learning for a group of students studying in New Zealand. The study was conducted using a survey and interviews to delve into an understanding of the advantages and disadvantages of online education from the student's perspective. The intended audience for the research are academics, instructors, and the designers of online course modules, as well as those involved in the design of institutional educational learning systems. It was seen that although research on the definition and various facets of online learning is numerous, the literature regarding the advantages and the disadvantages of online learning was very limited. The study identified that the role of technical infrastructure and internet connectivity is paramount in ensuring the success of the online learning. Also, content and technology providers need to provide portable, high-quality, inter-operable solutions so that the same content can be delivered across the different institutions and different departments within the same institution. Further, the advantages can be leveraged to increase the popularisation of online education and inform best practice in using online learning platforms.

Chapter 1 Introduction

Research Overview

The rise of the internet, alongside the worldwide availability and development of digital communication services, has brought online learning technology to the attention of established tertiary institutions, as they seek better and more effective ways of reaching students and delivering educational content. Educational institutions are currently equipped to provide distance learning opportunities through online classes for students (Picciano, Seaman & Day, 2015).This realisation has led to a departure from conventional methods which require strict attendance from students at lectures (Bakia, Shear, Linda, & Toyama, 2012). The quantum of spread of online learning can be measured in a quantitative manner by identifying the number of students benefiting through online courses. Online learning environments are thus able to encourage higher level education for students who, due to either work, social, or family commitments, would find it difficult and are otherwise unable to participate (Nguyen, 2015; Mitchell & Delgado, 2014).

In an ever-connected world, online learning is increasingly relevant, though the way it negates the limiting physical barrier of location, and as it enables an integration of ideas from vastly different perspectives and cultures (Squire, 2018). While many students have engaged in successful learning through online environments, some factors detract from the efficacy of these learning platforms, limiting their reach, including the increased time and commitment which is demanded from online courses, and the lack of a physical connection also impairs co-operation with course mates (Mehdipour & Zerehkafi, 2013). The online mode of learning has been found to be more convenient and flexible around students' various family and social commitments. However, a challenge to the online learning platform is academic integrity (Stott, 2014).

These problems validate the need to carefully examine the benefits of these platforms against potential drawbacks. Online learning is not showing any signs of slowing, and with rising enrolments, we are required to collect more data concerning the view of the participants of these courses. The student's perception is of primary concern in these studies, as students are set to benefit from these opportunities. To evaluate the influence of online tools on the current learning experience, information has been collected from students who have been participants in online courses. These students' perceptions of the advantages and disadvantages of online learning are therefore examined in this thesis.

While online learning has been gaining popularity in the United States, almost no evidence is present regarding the impact of the implementation of the online learning process on student learning theory (Thomas & Thorpe 2018; Bowen, Chingos, Lack & Nygren, 2013). While the study has implemented in the process of identification of the key points of the implementation of the online and blended learning methodology, knowledge regarding the effectiveness of the mode of learning in the clinical or practical domain is limited (McCutcheon, Lohan, Traynor & Martin, 2014). A major question has been raised about the viability of the Massive Open Online Courses (MOOC) in regard its potential to be accessible to the higher education network. A study regarding the implementation of MOOC has failed to determine the reasons for low engagement in spite of the high rate of enrolment in the modules (de Freitas, Morgan & Gibson, 2015).

The study in this thesis was conducted using a survey and semi-structured interviews to identify the various facets of the advantages and disadvantages of online learning. The use of semi-structured interviews has led to the development of understanding in individual perceptions of the implementation of online modules, such as in Massive Open Online Courses (MOOC).

This has aimed at increasing the viability and sustainability of the system. The semi-structured interviews have been selected to contribute to the trustworthiness and the objectivity of this study. Based on these results, the audience should be in a position to identify the range of advantages and disadvantages of online modes of learning. Since the research reflects the view of the generalised student community as well as the view of the individual respondents. The views of the generalised student community was obtained by conducting the anonymous paper-based surveys. It can be used to create a platform for the creation of a standard online module with a higher visibility of student needs – this may lead to higher levels of performance. The designing of an online module will lead to a higher level of visibility because it will contain the aspects which are considered as advantages of a majority of the students. It will also assist in improvement of the entire process of online learning delivery methodology because the perspectives of the different stakeholders have been derived from the research.

The mixed methods of research has been used to identify the same concept using different measures. The strengths of one of the methods can be used to overcome the challenges of the other methods. The results of one method can be used to validate the results of the other methods. In this case, the results obtained from the semi-structured interviews can be used to validate the results of the survey process (McCusker & Gunaydin, 2014).

In order to improve our understanding of student perceptions of the advantages and disadvantages of online education a study was conceived that combined a survey and semi-structured interviews of students who have recently engaged in online education. The main/key results from that study were the understanding of the advantages and the disadvantages of the online mode of learning. These outcomes can be utilised by the audience to delve into the reasons behind the delay in the proliferation of the online learning mode.

Thesis Study
Purpose of Study

The purpose of this study was to understand the advantages and disadvantages of online education from the perspective of students and instructors. The findings of this research would play an important role in the understanding how online learning will be able to contribute to the learning spectrum. Modern technologies have been able to generate a wide variety of choices for education. Schools and institutes of higher learning have recognised the potential of online learning to transform the entire relationship between the people they educate, their skill sets, and their resulting performance. It has been found to have a greater significance in the institutes of higher learning (Porter, Graham, Bodily & Sandberg, 2016). This aspect of online learning has been closely studied with respect to the different stakeholders who are involved in the process of online learning and its implementation. Upon detailed review of the literature associated with the domain of online learning, it has been seen that different aspects, such as stakeholder analysis, has not been given due justice in previous research. This has been attributed to the nature of the research which has mostly been focused upon the learning pedagogy and the technicalities of the process. Individual research has focused upon the different sections of stakeholders. However, the identification of the complete canvas of stakeholders is yet to be executed. Hence, it has not been possible to do justice to the stakeholders in terms of the identification of the advantages and disadvantages from their individual perspectives. While the online learning process has been given focus, the needs and requisites associated with the process is yet to be highlighted. While on this topic, it has been seen that there is a huge challenge in the conversion of the face-to-face curricula into a parallel and rich online experience (McDaniels, Pfund & Barnicle, 2016). With respect to online learners, namely the learners who do not have access to the traditional means of education, there is a research gap in the use of the online learning platform. The research by

Safford & Stinton (2014) aims to identify the challenges faced by online learners (Safford &

Stinton, 2014). Dziuban et al. (2015) have dwelt upon a possible connection between the factors

of student satisfaction while using online learning, with the theory of the emergence of a

psychological contract (Dziuban et al., 2015).   The research in this thesis study,

investigated the advantages and the disadvantages of online learning with respect to the different

stakeholders which comprise of domestic and international students, the academics and

administrative support staff, and the other stakeholders who have been involved in the process of

online learning. The effectiveness of the online learning platform has been studied with a special

focus on the institutions offering higher education in New Zealand and Saudi Arabia.

Research Problem

In the Kingdom of Saudi Arabia, graduates of online qualifications are not as likely to

gain employment as those that have undertaken their education in face-to-face settings due to a

perception that the education is not as competent as face-to-face learning, and yet so many

benefits may be realised through online education (Gashan & Alshumaimeri, 2015). The research

problem that this thesis deals with is focused on uncovering what are the perspectives of students

to see what the factors are that may be contributing to this situation. For future graduates of

online education programmes, and those that deliver them, it was hoped that this study may

uncover helpful insights that may explain the phenomenon. While the thesis does not compare

between countries, it was anticipated that the problem explored would be applicable to learning

domains in Saudi Arabia and New Zealand. This study aimed to create a platform in conjunction

between the situation with students in both Saudi Arabia and New Zealand. The prime objective

of the study was to create a landscape of the advantages and the disadvantages of the mode of

online education, which will enable the learners, or prospective learners, to make an informed

decision.

It is important to understand the advantages and disadvantages of online learning to present a veritable platform for comparison (Rajab, 2018). Online learning can be defined as the process of education at a recognised institution where the students do not need to attend classes on the campus. In the current digital era, the internet has evolved as one of the vital means of sharing of resources for learning and research for both the instructors and the students (Anshari, Almunawar, Shahrill, Wicaksono & Huda, 2017). Based on the technology, e-learning includes the use of technology and its related assets to create materials for the process of learning, to educate the learners and regulate the courses prescribed by educational organisations. As a concept, e-learning is comprised of a range of applications, methods and processes. As it has various facets to it, it is therefore difficult to arrive at a common definition for the entire process of online learning.

The conventional educational platform has been encountering various problems in the area of infrastructure requirements, course versatility, scalability of the courses and the balancing of the time of the students and the instructors. The conventional mode of learning in a brick-and-mortar classroom has invited a wide array of issues in the realm of management, scheduling, balancing and communication. In view of these problems, the online mode of learning was therefore conceptualised. Like all other initiatives, this concept was also endowed with its own set of pros and cons. However, after the launch of online programmes it was essential to identify the advantages and disadvantages of this mode of learning. Identification of the advantages was essential so that these could be leveraged upon to create a positive base for this mode of learning. The creation of an efficient platform would serve to establish online learning methodology as a form of execution as opposed to being an exception. Along similar lines, it has been seen that

identification of the disadvantages would serve to provide impetus for the overall improvement

of the online learning process ("What is online learning?," 2018).

Research Question

The research question for the thesis study was:

What are the advantages and disadvantages of online education?

From the current thesis, it can be seen that the type of diversity that might be handled in

an online educational environment are in the following areas – students who belong to non-

English speaking backgrounds, learners who belong to a specific racial or ethnic group, learners

who are studying in a country which is foreign to their own, leaners who belong to remote or

rural areas of a region, specially-abled students, learners who belong to a non-traditional field,

and learners who have not been able to continue their education due to various factors such as

employment opportunities.

Figure 1.1 Online Learning Ecosystem

Figure 1.1 shows the different factors which have a strong impact upon the domain of online education.

Research Significance

Changes in funding patterns and the quality of student profiles have led to an increase in an emphasis upon the deployment of flexible and dynamic modes of course delivery in the higher education sector. As part of this trend, communication and information technology has found a pivotal place for itself (Tempelaar, Rienties & Giesbers, 2015). The availability of dynamic resources has also led to an advent of dynamic modes of delivery methods. Unforeseen questions which have been raised include questions on the effectiveness of these modes, the rate of interaction between the students and the teachers, and the rate of interaction between the students and their fellow peers involved in this method of learning (Wihlborg, Friberg, Rose & Eastham, 2018).

A conflict has surfaced between an increase in the efficiency of the delivery systems and the need for improvement in the teaching methodologies (Thomas & Thorpe, 2018). Owing to this, universities around the globe, are facing a dilemma which requires them to choose investment options between the online mode of learning and the offline mode of learning. The primary question that has been raised is whether the online mode of learning should be able to positively influence the quality parameters of the education system. In addition, online learning needs to be verified if the changes would have the potential to improve the efficiency of the system through the use of advanced communication technology. However, one thing that is clear from the outset is that an online mode of learning would invoke large expense in terms of hardware infrastructure and network set-up.

Intended Audience

The intended audience for the research undertaken in this thesis are the learners, instructors, designers of online course modules and also the designers of the institutional educational learning systems.

Methodology

Research methodologies used in the field of online education vary greatly from the research methodologies used in other fields of research. This can be attributed to the huge variety of members in the targeted sample space. In addition, the demographic distribution in the educational sample space is very narrow (Boria, Olson, Goodman & Anderson, 2014). The chances of receiving an objective viewpoint based on demographic considerations is likely to be fairly minimal (Shea & Bidjerano, 2014). The various kinds of research methodologies that have been deployed in this case are as follows:

- Literature Review

The primary step which is deployed in the development of a body of knowledge begins with the analysis of the previous research conducted in the same area in the field, in order to understand the extent to which the previous researchers have analysed the same issue. In this case, internet access was utilised to search for books, theses, and conference and journal articles to understand the various facets of online learning. The various dimensions of online learning that have been studied in detail are the origins and various types of online learning, the stakeholders of the process of learning, the impact of the learning methodology on the different stakeholders, the advantages and disadvantages of online learning and its future scope in the arena of learning. Since the research in this thesis has focused upon the advantages and disadvantages of online learning, the focus of the literature review therefore has also been on these features (Hamid,

Waycott, Kurnia & Chang, 2015). Hence, the keywords that have been used to conduct this study are: advantages of online learning, disadvantages of online learning, scope of online learning, stakeholders of the online learning process, and stakeholder analysis of the online learning process. The process of evaluative learning has been considered to be different from that of associative learning. As part of this analysis, it can be said that the learners associate stimulus with their learning abilities. Hence, research on online learning methodology needs to develop a research solution towards the provisioning of stimuli to the respondents which will enable them to associate it with the process of online learning (Purkis & Lipp, 2010). The stimulus, in this case, is essential in the case of evaluation of the impact of the online learning process as it is analogous to the impact that online learning has upon the stakeholders. The domain of stimulus upon the learners has a strong impact upon the ability of the learners to grasp the concepts that are being delivered.

- Mixed Methods

The mixed method of research has been deployed in this case, to ensure that the entire scope of the study environment is covered. It is a more specific method of research which includes mixing of both qualitative and quantitative modes of data collection and research data analysis. It has been attributed for the purpose of analysis of the demographic considerations regarding the advantages and disadvantages of online learning. It is vital to design the research methodology in such a manner that optimum details are obtained from the response to the research methodologies. This research has employed the use of a mixed-methods approach to identify the various advantages and disadvantages in respect to online learning. With the use of multiple methods there is an expectation of creating a wide plethora of options regarding the advantages and disadvantages of online learning.

- Semi-structured Interviews

To understand these issues of online learning, it was important to conduct a study on the experiences of the different stakeholders who are involved in the process of learning through an online method. The students have been experiencing a shift from the offline mode of learning to the online education process. It has been seen that they are equipped for the same owing to their continuous usage of technology in their day-to-day activities. However, there are a wide range of stakeholders involved in the process apart from the students. It was essential to understand the perspective of all of the stakeholders. The analysis of the stakeholder experiences would lead to the presentation of a different perspective which would allow for the generation of solutions to the aforementioned issues (Davis & Singh, 2015). The use of semi-structured interviews with the subject matter experts grants a view into the field of analysis of the advantages and disadvantages of the online learning method. The combination of an anonymous survey and semi-structured interviews will serve to identify the two aspects of the research objective – identification of the impact upon the stakeholders and identification of the advantages and disadvantages of the online learning mode.

- Surveys

In this case, a combination of anonymous paper-based surveys and semi-structured interviews have been used to delve into the individual perspectives of the respondents. The anonymous survey allowed the respondents to provide their perspective on the advantages and disadvantages they experienced.

Thesis Structure

This thesis starts with the details of the introduction to the subject. The research details have

been highlighted and a conclusion on the topic has subsequently been reached. The thesis has

been divided into the following chapter structure:

Chapter 1. Introduction – This chapter provides an overview of the topic along with a brief

description of the objectives of the research.

Chapter 2. Literature Review – This chapter provides the details of the previous research that

have been conducted in this subject area.

Chapter 3. Methodology – This chapter provides the details of the methodologies that will be

invoked during the research.

Chapter 4. Data Analysis and Results – This chapter provides the details of the data received

as part of the research.

Chapter 5. Discussion – This chapter is comprised of the discussions that have been

conducted around this topic.

Chapter 6. Conclusion – This chapter provides the conclusion of the research.

Summary

This introduction has presented the domain of online education and provides an overview

of the relevant literature on e-learning. A research gap in the knowledge of student and instructor

expectations of online education and the subsequent research problems have been identified –

specifically there is a need to uncover the perceived advantages and disadvantages that students

and instructors have of online education. The research question has therefore been formulated:

What are the advantages and disadvantages of online education? The design of the study undertaken for this thesis was presented along with the underpinning mixed-method approach. The theoretical contribution of this research has been the identification of the advantages and disadvantages of online learning from this study. The practical contribution of this research has been the identification of the causes because of which the level of employment of online learners is low.

Chapter 2 Literature Review

Introduction

The literature review intends to analyse the different studies that have been conducted on the topic in the past. As a part of this analysis, recent research was studied to identify the salient points related to the advantages and disadvantages of online education. The limitations were also considered to see the aspects which could be included as potential recommendations for future research following the present study. The purpose of the different sections have been studied in relation with the research.

- Defining Online Learning: The definition of online learning has been studied as a part of the section.

- Online learning characteristics: This section plays an essential role in earmarking the key characteristics which are essential for this research.

- Impact of online learning: This section discusses the impact on the key areas

- Administration and Control: This section discusses the key aspects of administration of online learning. This is essential when online learning is deployed in an educational set up.

- Perceptions of Online Learning: This refers to the perceptions of key stakeholders. This is important because online learning is being implemented in an educational set up

- Enabling Collaboration: The importance of collaboration has been highlighted as the platform of online learning is different from that of the traditional learning platforms.

- Involvement of Students: The entire purpose would be defeated if the students are not involved.

- Internet Connectivity: The role of internet is quintessential in the domain of online learning.

- Role of Technology and multi-media: The role of technology is quintessential in the domain of online learning.

- Popular Learning Systems: The popular learning systems are considered as examples or benchmarks

- Learning Theories: This section addresses the key learning theories which are used to address the current scenario.

- Focus on Interaction and Communication: The importance of interaction and communication has been highlighted as the platform of online learning is different from that of the traditional learning platforms.

- Importance of Online Education: This section justifies the requirement of online learning

- Motivation and Concerns: The motivation and concerns of the different stakeholders have been discussed.

- Cloud Deployment Models: The cloud deployment models have been discussed as a requirement for online learning

- Key Considerations: This section reflects on the key takeaways from the literature review

Defining Online Learning

Popular definitions of online learning are listed as follows:

- Coursework which has been defined for the students, to be adopted at a distance (Simpson & Richards, 2015)

- Creation of a virtual learning environment which would facilitate better implementation of campus-based education (Hamari et al., 2016)

- Specification of online tools which can be deployed to create an enriched, efficient process of collaboration and interaction (Sung, Chang & Liu, 2016)

- Online, blended learning methodology (Gupta et al., 2018)

As a blend of the above definitions, online education can be defined as a utilisation of multi-media technologies and the internet to improve the quality of learning. This can be implemented by creating an ease of access to the services and facilities on offer in addition to facilitating exchanges and collaborations from a distance. Online learning also refers to the use of advanced technologies which facilitate the access to online resources. In a broader sense, online learning can also be referred to as a learning methodology which can be accomplished in an electronic manner (Bowers & Kumar, 2015). This is a kind of learning which can be enabled through the use of digital technologies such as the internet and social media. Other researchers have defined online learning as the deployment of information technology in a diverse mode of education to enhance the learning patterns in institutes of higher education (Hyman, Moser & Segala, 2014). It includes the use of information communication technology to complement the conventional mode of learning. The prime focus of online learning lies in the disbursement of learning tools and resources through an electronic mode. Currently, the scope of online learning is confined to computers and the internet. In the next phase, it is expected to roll out to wireless systems and satellite with the learning medium primarily being via cellular phones (Agudo-Peregrina, Iglesias-Pradas, Conde-González & Hernández-García, 2014). The chief features of online learning are use of the internet, global sharing of learning resources, broadcast of information and knowledge flow through network courses, and the overcoming of issues of distance and time.

Characteristics of online learning include: the use of a multimedia environment, the sharing of a wide range of information, the establishment of an e-learning system enabling collaborative communication, the creation of a network for accessing and disseminating information, and the incorporation of the systems on various kinds of operating systems and browsers (Oyarzun, Stefaniak, Bol & Morrison, 2017). Based on the above-mentioned characteristics, it can be safely assumed that the crux of online learning lies in the involvement of digital technology. Online Learning Ecosystem in Figure 1 depicts the ecosystem of an online learning framework. It can be seen that the online framework revolves around the digital technologies, distance-wise implementation, interaction, collaboration and efficiency. These items constitute the online learning network in a collective fashion. Similarly, the process of teaching is guided by the following principles:

1. Encouraging the presence of contact between the instructors and the learners (Oyarzun, Stefaniak, Bol & Morrison, 2017)

2. Development of reciprocity amongst the students (Richardson, Maeda, Lv & Caskurlu, 2017)

3. Use of active learning techniques in the teaching cycle (Pedaste et al., 2015)

4. Provisioning of prompt feedback to the deliverables (O'Flaherty & Phillips, 2015)

5. Emphasising the completion of tasks within a particular deadline (Kurlaender, Jackson, Howell & Grodsky, 2014)

6. Communication of expectations between the instructor and the learner (Peterson, Rubie-Davies, Osborne & Sibley, 2016)

7. Mutual respect for diversity in talent and learning modes (Jaggars & Xu, 2016)

In this thesis, the terms online education, online learning, and e-learning are used synonymously and essentially mean internet-enabled distance education.

Online Learning Characteristics

Online learning has brought the entry of information and communication technology into the arena of teaching and learning. The internet has offered a variety of ways to distribute and provide resources which can be utilised for a wide number of purposes, including education and its implementation. Technology-based online learning, encompasses the use of internet technology for the purpose of production of materials for learning, teaching learners at different levels of proficiency, and regulation of courses. In a broader sense, online learning relates to the use of information and communication technology to provide access to online resources for the purpose of teaching and learning. On the other hand, some researchers like Liaw (2016) have limited the scope of online learning to internet-based or web-based learning only (Liaw et al., 2016). It has been identified through the fact that they believe that online learning includes all kinds of learning which is carried out through distributed learning, distance learning through the online mode, and hybrid learning which includes a wide variety of learning patterns which are disbursed online. The purpose of the thesis is to identify the advantages and the disadvantages of online learning. There is a strong need to identify these factors which create a disadvantageous situation for the learners and proponents of online learning so as to increase the focus of the learners in the arena of online learning.

Impact of Online Learning

One of the key impact factors is absenteeism. It has been seen that the rate of absenteeism is much higher in the case of online learning as compared to conventional learning which has been attributed to geography (Kizilcec & Halawa, 2015). Kizilcec & Halawa have established that conventional modes of learning are associated with the geographical presence of the learners.

The face-to-face interaction of the learners and the instructors being in the same location geographically, discourages the learners from remaining absent. Further, in various cases, the learners have been found to be residing on the university campus, thereby reducing the need to travel, thus placing it on the same platform as that of online learning in terms of learning advantages.

Administration and Control

The establishment of a decentralised control strategy over the entire sphere of online learning would lead to a solution to the optimal control problem. This relates to the need for the establishing of control over the aspect of student attendance. The aspect of student attendance has been given high importance because it has a strong relationship with the rate of success of the methodology. Liu, Wang and Li have established the need to enable digital universities to keep track of the learning statistics in terms of geography (Liu, Wang & Li, 2014). This requires the need for detailed reports on students linked to participation, retention, and success. To overcome these discrepancies, it is crucial to keep track of the cultural and gender divides and make efforts to bridge them. This is essential to the success of the online learning process because it is not bound by geographical borders (Arafeh, 2018). The analysis and evaluation can be conducted on the different facets of online instructions, student satisfaction and the domain of e-learning (Cole, Shelley & Swartz, 2014).

Perceptions of Online Learning

The emergence of negative perceptions at the beginning can be highly detrimental for the proliferation of the online learning platform (Kauffman, 2015). The role played by student perceptions is greatly determined by the importance of engagement strategies in the online learning environment. The different kinds of engagement strategies reflect upon the level of effectiveness of the online learning process or implementation (Martin & Bolliger, 2018). With

respect to perception, the students and the instructors would lie on different platforms. Owing to

this factor, this research has conducted a separate analysis into both the perception of the learners

and the instructors (Bolliger & Martin, 2018). For this matter, it is essential to measure the

quantum of student engagement. The measuring of the quantum of student engagement would

lead to an understanding of the depth of the problem, based on which the severity and priority

can be determined (Dixson, 2015). Technology plays an important role as an enabler in the

process of augmenting the rate of engagement of the students. The online learning arena is solely

dependent upon the precincts of technology. Hence, any kind of deviation within the

technological framework would act as a deterrent to the learners (Günüç & Kuzu, 2014).

Enabling Collaboration

The primary role which is played by technology in the area of online learning, is that of

enabling collaboration and communication between learners, and between instructors and their

learners. Hence, it is vital to understand the levels of student engagement during the management

of collaboration during an online learning initiative (Halpin, von Davier, Hao & Liu, 2017). A

lack of collaboration can act as a determinant in identifying the various reasons responsible for

any reduction in the interest of the students or the increase in the interest of the students, which

can be translated into the advantages and the challenges of the online learning methodology

(Meyer, 2014). The aspect of online learning in the domain of higher education is of huge

importance as compared to that of the other arenas such as that of entry-level vocational learning.

Hence, identification of the advantages and challenges in higher education needs to be more

focused (Dumford & Miller, 2018) and a core focus of the study in the present thesis. This

provides empirical data on student satisfaction with respect to the online learning platform

(Palmer & Holt, 2009).

Involvement of students in the process of online learning

The inclusion of student-produced videos as learning objects is also expected to augment the

level of student interest of online learning. This can be attributed to the end-to-end involvement

of the students in the different aspects of content development and proliferation (Stanley &

Zhang, 2018). Apart from communication and collaboration, technology can be employed to

make the curriculum more engaging and interesting with the inclusion of high-end graphics and

visual displays. It is believed that the level of acceptance and focus on expanding the learner

base could be increased greatly, with the inclusion of technology using a multimedia-rich

platform and interfaces (Bledsoe, 2013). Hence, the fostering of student engagement is

comprised of a wide range of factors which include amongst others, the perceptions of the

students and their inclusion, consideration of the instructor aspect, and the provision of

technology (O'Leary & Giove, 2013)   Online learning is conducted in an environment

where the amount of structure is reduced compared to a conventional learning environment – it

is important to establish a structured flow of data between the learners and the instructors. In

addition, most of the learning occurs beyond the brick-and-mortar class room environment. The

lack of face-to-face interaction might lead to a situation where there may be distractions in the

form of peer pressure and other digital diversions. These distractions could lead to the non-

completion of assigned course curriculum and their respective tasks, thereby reducing the overall

effectiveness of the mode of online education ("Advantages and disadvantages of online

learning" | ezTalks, 2018).

Internet connectivity

The process of online learning is strongly dependent upon a stable internet connectivity

("Internet access and education: Key considerations for policy makers" | Internet Society, 2018).

Access to a strong internet connectivity has been considered to be a key fundamental in the

achievement of the vision of achieving widespread education. In this thesis, internet connectivity

refers to the connectivity for the instructors and the internet connectivity at the learner end. At

the instructor end, the internet connectivity is required to ensure that the content is delivered

from the institutions in a seamless manner. As part of this connectivity, it is crucial to maintain a

high-speed connectivity to deliver the content in an efficient and stable manner. Further, the

importance of a seamless delivery cannot be negated. "The delivery of seamless services has a

high impact upon the efficiency of the learning methodology. The optimum implementation of

the learning methodology plays a crucial role in ensuring that the interest of the learners is

retained. In competition with the conventional mode of learning, the online learning

methodology loses out," because the conventional mode of learning is completely devoid of the

need for any kind of internet technology. Similarly, in the context of internet connectivity at the

client end, it is pivotal to maintain a high-speed connectivity to deliver the content in an efficient

and stable manner ("Advantages and disadvantages of online learning," 2018)

The use of Udemy or Udacity allows the download of the lectures and content for offline use

easily enough, so it continues to operate seamlessly when offline for several hours.

A huge number of technical resources are widely available for the deployment of online

course modules. These resources used within the modules refer to the availability of online

course editors and moodles. In turn, the technical interventions of online learning act as

facilitators to promote online education for practical subjects such as engineering, architecture

and nursing as well. The inclusion of enablers for practical learning has added an entirely new

dimension to the conventional concept against the implementation of online learning in the

practical arena in areas such as engineering, architecture and nursing. The factors which have

played a key role in the enablement of the online learning functionalities are ease of access, understanding and navigation, as part of "the ease of access theory" (Haythornthwaite et al., 2007). There is a strong emphasis on the timely delivery of the access credentials which should be conducted in a swift and user-friendly manner. The entire process of the delivery of user credentials should be enabled online (Haythornthwaite et al., 2007) and should not require any kind of physical trip to the institution. The elimination of the need to travel to the brick-and-mortar classrooms is vital for the learners. The elimination of travel is essential because the learner should be able to carry out a significant portion of their activities, once they receive the user credentials for the common website. The next aspect of the delivery of online learning lies in ease of understanding. As part of the ease of understanding, the user should not require any external assistance in understanding the functionalities of the course modules or their navigation. The core principle of online learning states that the website should be user-intuitive and user-friendly. The last principle, ease of navigation, states that the website should be easy to navigate. In other words, access to the different parts of the course module should not be a difficult task. The users should be able to access all the different parts of the modules with a few clicks only. The bottom line is that the focus of the users should be on the understanding of the online course as opposed to gaining access to the online course modules. While the research has focused upon the need for internet connectivity, there is a lack of structured inventory of requirements for the purpose of online learning. Most research has emphasised the need for internet connectivity in the process of online learning.

Role of Internet technology and multi-media

The advent of internet technology and multi-media has brought a radical shift in the way education is delivered across the globe. Development of the internet platform has generated a wide variety of choices for education stakeholders across the globe. The agendas of the

educational institutions have recognised online learning as a positive prospect to transform the way knowledge is delivered, skills are imparted, and educational performance is measured. The inclusion of online learning in the educational process requires diametric changes in the educational delivery and support processes of various institutions (Porter, Graham, Bodily & Sandberg, 2016). Similar to the different kinds of online learning modes, there are typically three different ways in which online learning is delivered. These particular ways of delivering online education have been classified under three categories. These categories are: the adjunct category, the blended online learning category and the online category of delivery (Porter, Graham, Bodily & Sandberg, 2016). The adjunct mode of learning refers to the conventional mode of learning. This relates to the learning that is delivered from brick-and-mortar classrooms only. The blended mode of learning refers to the learning methodology where a part of the learning is delivered from the brick-and-mortar classroom whereas a separate part is delivered through the online mode. This can be explained by an example of a class where the course curriculum is delivered in the brick-and-mortar classroom, whereas the assignments and examinations are conducted online. The online mode of learning is self-explanatory and refers to the mode of learning where the entire focus is placed upon the end-to-end delivery of the online learning methodology.
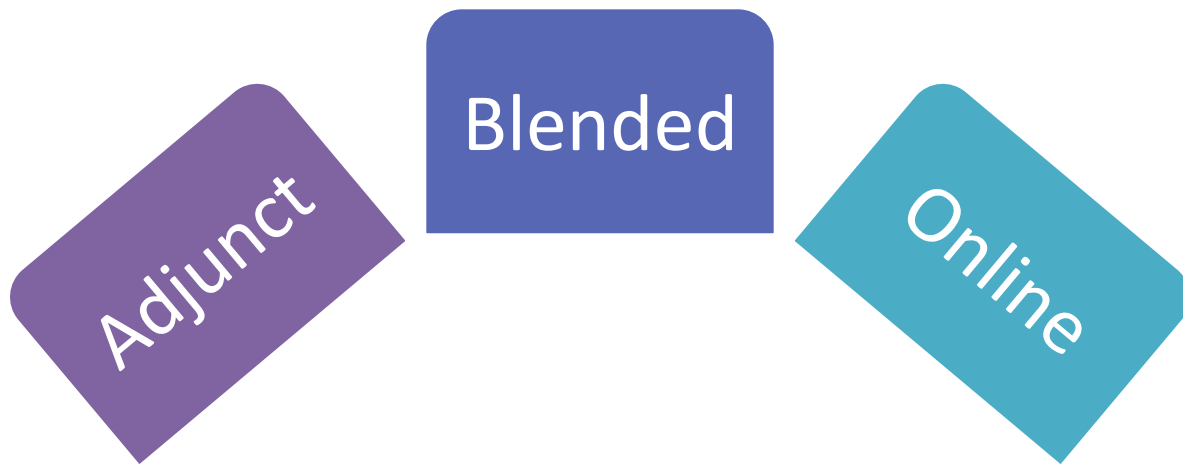
Figure 2.1: e-Learning Methodologies (Feldstein & Neal, 2006)

Although the methods of online delivery have been categorised into three different ways,

they can also be viewed as a road map to achieve complete online delivery of education. At the

outset, the institutions deliver education through the adjunct mode of learning ("Adjuncts'

working conditions affect student learning, report says," 2018).Subsequently, with the evolution

of technology and the mindset of the instructors and the learners, the educational process moves

to modes of blended learning. Blended learning is a mid-way between the offline process and the

online process. The institutions deliver a part of their education process online and a different

part of the educational process over online mediums. At the far end of the spectrum lies the

complete online mode of delivery. The primary characteristic of this mode is that there is

maximum independence on the part of the students. The individual model is typically divided

into two parts – the individual learning aspect and the collaborative learning aspect.

e-Learning

This thesis is primarily focused upon the domain of online learning only.

Popular e-Learning Systems

The key success factors of higher education are determined by the following factors – the characteristics of the learners, the characteristics of the instructors, the nature of the learning material, the context of the learning scope, and the learning objectives that have been determined for the learners (Al-Zahrani & Laxman, 2016). In the conventional view, the learners are expected to learn from their instructors. In this scenario, behaviorism is known to be a popular learning theory. In behaviorism, the roots of learning are based in scientific positivism and the process of passing of objective facts from the instructors to the learners (Baxter, Callaghan & McAvoy, 2018). Although this process was found to be highly influential in the early stages of the development of educational technology, currently implemented theories in the area of higher education have proven that learning is more of an internal and intentional change process. Based on this perspective, learning is not just a process of delivery and acquisition of knowledge; it requires the active and intentional engagement of the student during the learning experience. This leads to the inference that the quality of education is the prime differentiator for all the learning processes.

Learning Theories

In this arena, two prominent learning theories have evolved over time – phenomenography and constructivism.

Phenomenography wouldn't really be considered a learning theory although it is used as a framework for educational research. It is a qualitative research methodology, within the interpretivist paradigm, which investigates the different ways in which people experience something or think about something – including learning. It is considered an approach to educational research – not a learning theory.

There are many theories that take different philosophical approaches to the ways people learn. The main branches of learning theory are behaviourism, cognitivism, connectivism and constructivism. Educational learning theories attempt to explain how people learn.

Behaviourism is a response to external stimuli; for example, as a child we are socialised to behave for life in companionship with others.

Cognitivism is the acquiring and storing of information. Its focus is on making knowledge meaningful and helping learners to organise and relate new information to their existing knowledge in memory. It involves reasoning, problem solving and information processing.

Connectivism is the integration of principles explored by chaos, network, and complexity and self-organisation theories. Learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning is focused on exploring and connecting specialised information sets, and the connections that enable us to learn more than our current state of knowing. In connectivist learning, a teacher will guide students to information and answer key questions as needed, in order to support students learning and sharing on their own. Students are also encouraged to seek out information on their own and express what they find.

Constructivism is a philosophical viewpoint about the nature of knowledge. It focuses on how humans make meaning in relation to the interaction between their experiences and their ideas. Constructivism suggests that knowledge is first constructed in a social context and is then appropriated by individuals. The process of sharing individual perspectives results in learners constructing understanding together that would not be possible alone.

Phenomenography

Phenomenography is a unique theory of learning which has evolved from studies conducted in the 1970s, in the field of education and learning. This theory identified the various approaches of student learning such as the 'deep approach' and the 'surface approach.' This study has given rise to the study field which came to be known as student learning research in higher education and learning. As per this theory, the perspective of the student is fundamental to the process and experience of learning. This theory states that the world is not an independent entity, from the learning perspective. However, the world exists in view of the learner only. In other words, the learner plays the central role in the learning process. In a simple sense, the curriculum remains the same for all the learners. However, every learner perceives the same curriculum differently. The learning process is entirely dependent upon the 'experience' and the 'interaction' and hence, the lessons learnt will vary hugely. In this context, it is essential for the instructors to know the characteristics of the learners. This information plays a key role in facilitating the process of learning (Booth, 1997).

Constructivism

This theory proposes that learning is conceptualised as an active process where the learners construct new and unique ideas in an independent manner. These ideas are constructed on the basis of their experiences and knowledge that they have acquired in the learning environment. The learning occurs in the most optimal manner when the learning environment is authentic and original (Ma, Han, Yang & Cheng, 2015). For this reason, problem-based and case-based learning is favoured over traditional modes of learning which are embedded in books. The theory of constructivism has been based upon cognitive psychology. Individual constructivism can be defined as the construction of ideas and meaning by the individual

students based on their own experiences and cognitive imagination. Similarly, the idea of social

constructivism is the kind of creation of ideas wherein the process is carried out by a group of

individuals in a collective manner. This theory highlights the dichotomy between the

'objectivist' and the 'behavioral' aspects of learning. Constructivism is a perspective which

focuses upon the engagement of the learners in the entire experience of learning (Knoblauch,

2013).

The process of online learning has strengthened the ideas of social constructivism by

including the learners in the entire process of online learning as a manner of research and

implementation. This explains how the students engage in a learning platform by interacting with

each other in the online environment of learning. There is a strong distinction between the

philosophies of phenomenography and constructivism in the sense that the relationship between

the learner and the environment is highly differentiated. The factors which affect the

implementation of phenomenography include the level of education of the learner, the topic of

learning and the other contributors involved in the process of learning, therefore,

phenomenography has been defined as non-dualistic. On the contrary, as part of constructivism,

learners construct meaning from a world which has been considered external to the entire

existence of the students. In this case, there is a separation between the learner and the external

world. Phenomenography has also had a significant impact in guiding the teaching process with

the implementation of technology in the sphere of teaching (Ippakayala & El-Ocla, 2017).

Focus on Interaction and Communication

As part of a meta-data analysis of the field of online learning, it was seen that there are

three types of interactions – instructor and student, between the students themselves, and

between the learners and the course content (Abrami, Bernard, Bures, Borokhovski & Tamim,

2011). With the advent of the internet, it has become essential to understand the importance of delivery of online learning through the asynchronous mode of communication (Qiao, Tian, Qu & Du, 2010). It is also proposed by Qiao, Tian, Qu and Du to implement a structured method of online learning and interaction. This method shall be used to study the behaviour of the different stakeholders as it is vital to establish the communication mechanism between the different stakeholders (Denzinger & Kordt, 2016). Online learning has proven to be no less than a revolution in the field of higher education. This can be attributed to the wide variety of learning options available across the world (Hiltz & Turoff, 2005). The concept of fuzzy neural networks can be introduced to ensure that the connectionist systems are able to perform as per the requirements (Kasabov, 2001). Tools such as Moodle have contributed hugely to the arena of online learning with the institution of various collaborations and partnerships for the purpose of evaluation of geographically disbursed learners (Dougiamas & Taylor, 2003).

e-Learning in the universities of the Kingdom of Saudi Arabia

The National Center for e-Learning and Distance Learning was established in Saudi Arabia in 2005. The primary aim of this institution has been to create an educational system which would complement the existing educational system with the use of e-learning technologies. This institute has been instrumental in adopting various projects to assist in the transition of society to a digital society. It is believed this will, in turn, support the establishment of e-learning in Saudi Arabia.

A need for further research in Saudi universities

There is a strong need for further research on e-learning and learning objectives of courses offered by academics in Saudi universities because the teachers are facing complexities in the establishment of a successful e-learning and online learning system in Saudi Arabia (Aljaber, 2018). e-Learning is a sector which has been witnessing a significant growth in the

arena of higher education. However, the arena of online education in Saudi Arabia is still in its

infancy, in terms of online literacy. In addition, there is no clear framework or policy to

implement e-learning in Saudi schools successfully (Aljaber, 2018). Hence, there is a need to

research and generate a clear plan to implement a new technology in the educational set up of the

country.

Gaps in e-learning systems and the changes required to bridge these gaps

The first gap in e-learning systems research is that of the geographical mapping of the

efficiency of the online learning platform. The second gap is that of the analysis of the impact of

the online learning implementation in the arena of technical education such as engineering

studies. The various stakeholders involved in the process of online learning are – the learners, the

instructors, the course designers and the network specialists. The learners play a central role in

the evaluation of the education modes and methods. As part of this justification, the prime focus

of the research method is on the learners. It can be seen that the instructors play the driving role

in the conventional educational process. Hence, the role of the instructors is also evaluated with

respect to the online learning process.

The instructors, learners and the other stakeholders have varying interests, preoccupations

and perceptions with regard to the teaching-learning process. The next gap lies in the individual

identification of the interests of the various independent groups. These aspects highlight the

diverse motivations, anxieties, aspirations and issues of the respective participants in the focus

educational area. The present research thesis also discusses a variety of perspectives on

opportunities and constraints in the educational process and the manner in which the participants

encounter the process, although the challenges in the processes have been left out in most

discussions. The quality of the educational mode and the social composition of the learners plays

a crucial role in determining the expectations which are projected for the educational system.

Importance of Online Education

Bernstein's expressive and instrumental order focuses upon the analysis of perceptional

images and the selection of educational facilities (King, 1976).
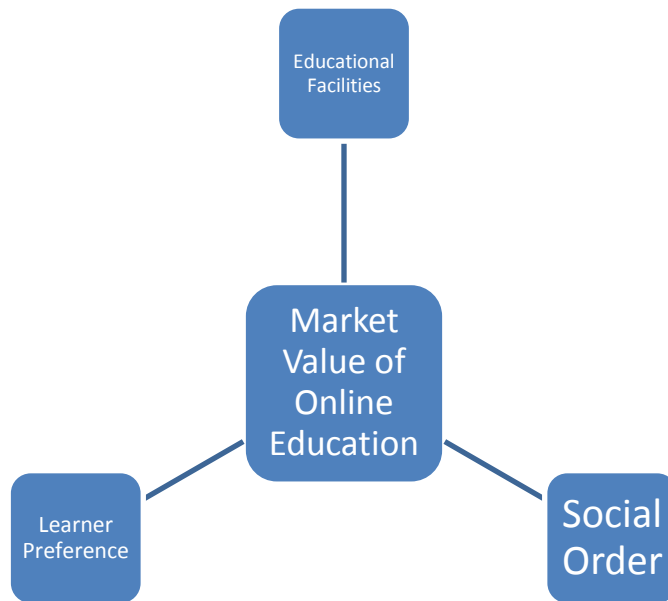
Figure 2.2: Market value of Online Education Methodology

This methodology has been used to evaluate the market value of the educational system based on

its identifiable achievements. It is important to focus upon the market value as the establishing of

the commercial value leads to the widespread implementation of the domain of online education.

The social order lays its preference on the basis of the ability of learners to fit-in to the makeup

of the schooling system. The personal order of the environment focuses upon the experience of

the learners to find themselves compatible with respect to the physical and mental safety in the

environment. The basis of evaluation of the educational system varies from the facilitating

conditions, the expansion of opportunities, value placed on the education and training system and

the encouragement received on the professional front (Janmaat, McCowan & Rao, 2016).

The surrounding environment of higher education is a continuously evolving arena.

Escalating costs, reducing budgets and an incremental need for distance learning are forcing

educational institutions to create efficiencies in the way education is being imparted. As a

response to the change in the environment, e-learning has found a widespread implementation

avenue.

Motivations and Concerns Stated for the Different Stakeholders
Student motivations

The primary motivation for learners lies in opportunity. Especially for students who

might not have had the opportunity otherwise to access the course materials owing to their

geographic, gender or time constraints. On the flip side, online learning poses an entirely new

environment of learning which requires an additional skill set to be successful. The ability to

think critically, research the issues and to evaluate solutions, plays a key role in the success of

the online learning process. By its inherent nature, online learning requires a level of technical

sophistication in order to achieve optimal results with respect to the course content. This issue

loses its relative importance in the eye of an increasing level of technical literacy. The term

'digital native' has been used to describe the generation which is under 40 years of age. The

increased comfort level with the use of electronic equipment like the smart phone and video

games, lends the same level of comfort to online learning also. However, this generation has also

been attributed with the characteristics of reduced attention span ("Digital natives and digital

immigrants — how are they different," 2018). Owing to this, they lose interest very easily which

leads to faster boredom with mundane online learning applications. With regard to this

generation, higher levels of interactivity have been included in the latest online learning courses and syllabus.

Instructors

As in conventional learning methodologies, instructors are also expected to play a guiding role in the online learning framework. However, depending upon the attributes of the specific online learning methodology, the instructor may, or may not, be face-to-face with the students. The levels of synchronicity of the instructors and the students is also expected to vary hugely. Instructors may be motivated to use the online learning methodology owing to its ability to reach out to a larger audience. The teachers might be keen to instill technology into learning. It needs to be noted that online learning heralds as much change for the instructors as it does for the learners and online learning pedagogy needs to keep up with the rapid adoption of technology (Thomas & Thorpe, 2018). At the outset, the adoption of an online learning methodology requires the acquisition of an entirely new set of skills and requirements, primary of those being the technical skills. Apart from that, a mindset shift is required which pertains to the role of the teacher in the conventional mode of learning versus the online mode of learning. In the conventional mode of learning, the instructors act as the primary source of students' knowledge. On the contrary, in the online mode of learning, the instructor acts as a manager of the students' knowledge resources only. The role of the instructor varies with respect to the attributes of the particular learning methodology. Technical sophistication is a mandatory requirement for learners and instructors alike. As part of the course administration process, the instructors are also required to learn the use of software applications at a steady pace. In certain cases, the instructors also act as the course creators. In those cases, it is imperative for instructors to have a thorough understanding of the student mindset as well. It has been seen that a primary handicap for the instructor in the online learning process lies in their lack of knowledge on how

to modify the instructional design patterns so as to be comfortable with the technology levels and student confidence levels. In these cases, the instructors are also responsible for the acceptance of the online learning tools by the students. It is imperative for the students to enjoy the online learning process while having a thorough understanding of the usefulness of the course curriculum. Another important consideration is the time taken by the instructors to create and administer the online courses. On one hand, some instructors believe that the process of online learning is less effort intensive and more time consuming, on the other hand, other instructors believe that the support staff and the faculty unit spend almost double the amount of time they would normally spend on the conventional courses. This has been attributed to a lack of technical sophistication and the need for an attitudinal shift towards the online mode of learning (McCafferty, 2014). This situation calls for additional incentives which can be provided to the instructors to improve the teaching/learning process.

Educational Institutions

The prime role of these educational institutions is to integrate technology into the common educational platform of learning. The focus of these initiatives is to facilitate efficient lecture delivery and create new opportunities for technology-mediated interaction in the classroom environment or a classroom-like environment. It is expected that once e-learning is widely accepted, more courses shall be offered online. This will ensure that the geographic boundaries between the institutions and the students will likely become redundant. Budgetary restrictions are a primary bone of contention for all institutions. Budgetary constraints lead to challenges in the implementation of wide and scalable campus solutions. In this scenario, it has been seen that individual entities try to implement their own, independent solution which might not be in sync with the entire organisation. This destroys the potential for cross-departmental cooperation and efficient implementation, which may also lead to problems in the coordination

between staff, students and other faculty members. These problems are escalated in the situation

where the entities belong to different departmental implementations. The implementation of an

online learning platform within an organisation is strongly dependent upon its existing

technological infrastructure. In a given situation where the technology base of an institution is

not up-to-date, the implementation of an online learning platform may require a significant

investment in the form of technological upgrades. The various components of an online learning

platform would include bandwidth for the implementation, technology equipped classrooms,

course management systems, adequate computer facilities for the teachers and the students, and

course transmission methodology. This increase in the technological base required also warrants

the need for provisioning adequate support staff, who shall be responsible for the routine

maintenance and upgrade of the technical infrastructure and to cater to the technological needs

and support needs of the students and the instructors. Another important contention for the

institutions lies in the assessment of the effectiveness of the online learning process. Although

this is a valid quantitative measure for the efficiency of the entire process, it is also important to

evaluate the effectiveness of the learning outcomes. The tendency of institutions to measure

progress in terms of return on investment, can lead to the development of cheaper, yet more

ineffective programmes. In the entire process of implementation, the core objectives of the

exercise may be defeated. The resistance of the faculty members, towards the new mode of

learning, is also an important area of change management for the institutions. As per the more

orthodox mindset (reference required), an online learning mode is considered inferior to the

conventional mode of face-to-face, in-person learning. This resistance can further be attributed to

the additional effort required for the implementation of the online learning process. It can also be

attributed to the functioning of the conventional mind set. Another important area of concern is the acceptance of online degrees by employers.

Content Providers

In the context of higher education, online course content can either be sourced from outside or can be created by the in-house instructors. The growing demand for the online learning environment has created a market for the creation of online learning content. The primary focus is upon the introductory courses which are offered by most institutions, and so the primary motivation for online content creators, both in-house and outsourced creation, is to build efficient content for the learners. Apart from that, commercial content providers are motivated by the profit acquired from the generation of online learning content. This avenue of income is expected to rise as the demand for online learning is expected to increase. These modules are expected to be developed in a flexible manner which shall have the ability to be utilised across the various institutions with a minimum amount of effort needed for adaptation. The capitalisation of intellectual property rights is the primary concern of the creators of online content. This is a major point of contention for the independent content creators as they need to retain intellectual property rights in order to be able to sell the material to multiple clients. This is essential to ensure the sustainability of the content creators.

Unavailability of technology standards are also creating issues for these stakeholders. In an ideal scenario, the online content should be created in such a manner that it would have the ability to be utilised across multiple platforms and modes. In addition, the developed course content should be aligned to the needs of the institutions within the context of the chosen learning methodology. Any kind of failure in this initiative would lead to a commercial failure.

Learning is parameterised by the content type, environment of learning, and the characteristics of

the learner. This aspect needs to be taken into consideration while developing the content.

Technology Providers

Technology providers are instrumental in the development of the technology that would enable

the delivery of online learning requirements. This section is comprised of a wide range of options

ranging from facilitation of distance learning courses to independent learning management

systems which are provided by companies like Blackboard. The primary motivation of the

technology providers is to provide an effective learning environment for the learners.

Technology standards have been considered to be an important consideration for the stakeholder

groups. The educational institutions are often inflicted by the issue of a lack of a common

technological platform with sufficient technical support. This has been attributed to the fact that

the different departments in the educational institutions work independently of each other. This

fact reduces the interoperability requirements of the departments. The constant evolution of the

expectations of the consumer and developments in terms of hardware has created a rush of

products into the market. The term "sustainable" can mean different things to different people,

the cost and effort in the pursuance of constant technological evolution needs to be controlled. A

majority of industry experts have attributed the disadvantages of online education to

technological issues and their lack of standardisation.

Accreditation Bodies

Accreditation bodies can be defined as those organisations which are responsible for the

assessment of the quality of educational offerings. The institutions meeting the minimum criteria

are accredited. The attachment of an accreditation adds a lot of value to the learning offering,

creating an edge for the accredited institutes as opposed to the non-accredited ones. With the

changing times, the proportion of education which is being delivered through online means is

expected to grow at an accelerated pace. In view of these changes, the accreditation bodies are

expected to relook at their accreditation policies and update them accordingly. These

accreditations are expected to be compliant with the needs of the educational system and the

employers of the prospective candidates. The growth of online learning platforms has thrown

new challenges for the accrediting bodies. As the demand for online learning methodology has

increased, the number of institutions seeking accreditation has escalated rapidly. This has placed

huge pressure upon the organisations in terms of evaluation and verification of the institutions

seeking accreditation, creating a steep increase in the volume of work encountered by these

bodies. In addition, these bodies need to deal with the vast change in the nature of their work.

Although all the online learning courses are subject to a similar kind of accreditation as the

distance learning courses, the accrediting organisations need to look at the institutions

thoroughly. In order to overcome these issues, it is essential for the accrediting organisations to

maintain a standard norm of accreditation. This prompts organisations to stabilise their process

of evaluation and final accreditation, recognising that unique considerations need to be adopted

for evaluation of the online process that institutions offer. The primary areas of concern are

alternative designs of instruction, alternative provisioning of higher learning and an expanded

focus upon the process of learning. Accredited institutions should be able to exhibit their

capacity to disburse education online.

Employers

In this context, the employers that are being considered by the organizations which prefer

to hire the graduates passing out of higher institutions in online courses. There is an increasing

trend in terms of acceptance of online learning as a mode of education (Thang, 2005). Hence, it

can be inferred that there is a higher level of acceptance of online methodologies.

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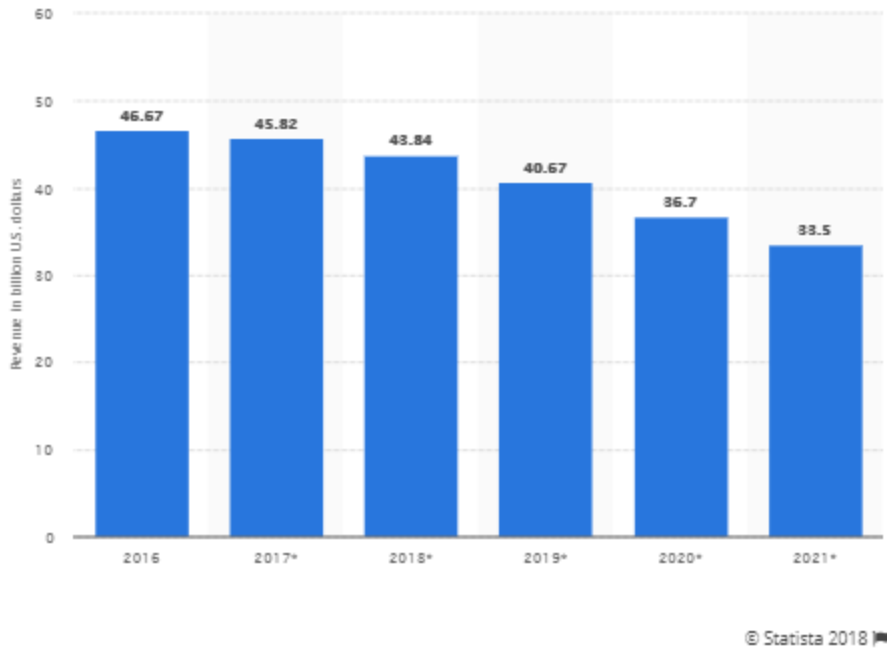
Figure 2.3: Statistics of worldwide e-learning market revenue in Bn USD

As shown in Figure 2.3 presents a decline in the growth of revenue for online education and the institutes delivering education in an online manner ("Global self-paced e-learning industry revenue 2021" | Statistic, 2018). There is a strong motivation on the part of employees to display a favourable attitude towards online learning and its implementation. The primary motivation is that inclusion of online learning opens up a wide array of employment choices for the employers. The students who were unable to participate in the traditional educational process shall be able to complete their degrees through the online learning process. Denying employment to the students who are being educated through the online learning process could restrict the pool of potential candidates. This could have a detrimental impact upon the process of education and hiring.
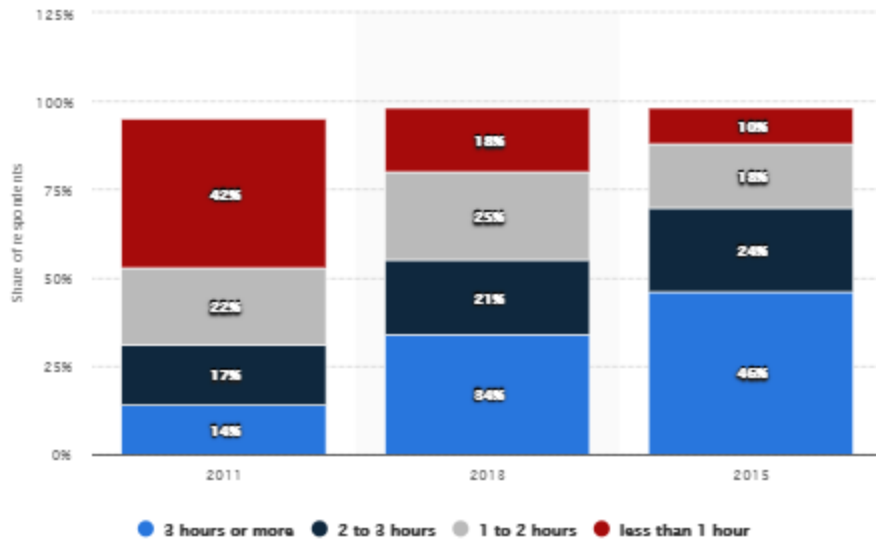
Figure 2.4: Average online hours in New Zealand

As shown in Figure 2.4, the growth in average online hours outlines an increase in the enabling

factors for online education ("New Zealand – average online hours at home 2015" │Statistic,

2018).

From another perspective, some organisations are more inclined towards hiring graduates

who have been educated through the online mode of learning. This can be attributed to the trend

being adopted by the organisations wherein they are moving from instructor led training to an

online mode of training. Hence, it is expected that the learners who have been educated through

the online mode of learning should be able to adapt to the online organisational training modes

more effectively and swiftly. It is assumed therefore that academic students who have been

trained through the online mode would be more able to understand the concepts of online

organisational training. This would also encourage the learners to pursue further education

while pursuing their careers. This move would also greatly benefit organisations such as

schools and colleges. Alternatively, employers value interpersonal skills more highly than

technical skills. However, it has been seen that although technical skills can be imparted

through the online mode, it is not as possible to deliver interpersonal skills training through the

online mode (Doo, 2006). This would require employees to develop their interpersonal skills

separately. The research has focused upon the aspect of the organisational compatibility of the

online learners effectively.

Cloud Deployment Models
Technology-based software and traditional e-learning software differences

Current e-learning models found their roots in the distance learning model of education.

At the outset, distance learning was introduced for the benefit of the individual learners in remote

areas. Technological advancement has played a key role in the process of evolution for distance

learning. The arrival of the internet has enabled the incorporation of many innovations in the

fields of higher education, secondary, post-secondary, graduate and post-graduate studies.

Cloud computing can be heralded as a new paradigm which can be used for obtaining

information and knowledge. It plays a pivotal role in providing a pool of computing resources

which have the properties of dynamic scalability and allows the usage of virtual resources, which

are offered as a service over the internet. These resources refer to the network servers, content

servers, applications, and software platforms. Cloud computing offers services under the

following categories – infrastructure as a service, software as a service and platform as a service

(Bora & Ahmed, 2013).

Benefits of cloud computing for educational institutions

Cloud computing provides a huge amount of flexibility to educational institutions. It

provides an effective, needs-based platform which is equipped with the infrastructure and the

required deployment models required to meet the dynamic demands of students. Hence, it helps

in overcoming some of the issues faced by many institutions, with regard to the setting up of the

infrastructure required for online learning. The efficiency imparted by cloud computing can

enable universities to meet the growing demands of the instructors and the students alike.

Further, the researchers will be able to focus upon the problem at hand rather than worrying

about the technological requirements of their proposed implementation (Bora & Ahmed, 2013).

Concerns and challenges in cloud-based e-learning

The concerns and challenges encountered in the implementation of cloud-based e-

learning systems are related to the security of the data that is stored in the cloud. Further, the user

of the system does not have any control over the maintenance time and the downtime of the

cloud-based service. Selection of the appropriate cloud service vendor requires good technical

knowledge of cloud-based implementation. Privacy and security play a pivotal role in the domain

of cloud-based e-learning.

Key Considerations

The process of online interactions are vastly different from face-to-face interactions. The

process of online interactions lacks vital feedback cues due to the absence of any knowledge

regarding the body language of the recipients (Thorpe, 2011). The students are also devoid of

any visual cues from fellow students in the class. This serves to reduce the extent of the

communication that might have occurred in face-to-face settings. In addition, the online

conversations are usually conducted in an asynchronous manner. In other words, there is a

substantial delay while receiving the reply for a particular message. This has an important impact

upon the quality of the conversation. On one side, this reduces the amount of spontaneity that is

involved in a qualitative conversation process. On the positive side, this has been offset by the

availability of a greater amount of time for reflection on the responses and the presentation of a

well-thought-out response.

It has been mentioned that there is a strong difference between cooperative learning and collaborative learning (Panhwar, Gopang, Chachar & Baloch, 2017). In the case of cooperative learning, the objective and its corresponding tasks are divided between the partners, on the basis of mutual consensus. Subsequently, the tasks are undertaken by the partners independently. In the end, the independent work items are assembled together to create the final product. A good amount of interaction and collaboration is required at the end, to assemble the final product. On the other hand, collaborative learning is a situation in which the learners work in sync with each other and interactively produce a solution which leads to the achievement of the overall objectives. Since the students work in sync with each other, the amount of communication required in the end is vastly reduced. This distinction highlights the amount of variance involved in the quality of communication involved in both the types of learning styles. The cooperative style requires a huge amount of communication in the beginning and the end of the work cycle. On the other hand, in the collaborative style of learning, the learners communicate with each other throughout the work life cycle. Online learning, within the precincts of the institution, is confined to the scope of a limited number of students. This can be attributed to the lack of technical support from the institutions. The online course content has been designed in such a manner that the learners can conduct most of the learning process through exploration and self-application. The online learning process has been based upon an understanding that users might require the support and understanding of faculty members for clarification of the course concepts. However, the user should not require any kind of assistance to navigate through the content resources or the course platforms normally. However, the inclusion of help text is essential for the arena of successful navigation of online learning materials.

Survey Justification

Several studies have been conducted over the years with the aim of uncovering the advantages of online learning. Among those studies is that by Al-Alawneh (2013) which was entitled: *Examining e-learning barriers as perceived by faculty members of engineering colleges in the Jordanian universities*. The study relied on a Likert Scale of 36 items where the students' perceptions were assessed based on: no impact, minor impact, moderate impact, and major impact of online courses. A sample of 176 faculty members involved in delivering online courses was collected. The conclusion was that online degree experiences, as witnessed by both male and female respondents, showed that higher education institutions needed to have strategic plans that encouraged adoption of online courses.

Park & Bonk (2007) conducted a study where eight students and four residential students were interviewed to identify the benefits and challenges of online learning using the web-based collaboration system as the conference medium. It was noted that learners valued feedback, meaningful interactions with their peers, and interactions with instructors, but time constraints and language barriers were perceived as challenges. However, there are students who feel they want to connect with their peers and establish some sense of social presence, hence they perceived online learning as a disadvantage.

The study done by Porter, Graham, Kristian and Spring (2014) needs to be addressed by the universities by implementing the process of online learning. The study showed a cost matrix tool where the cost of online education was compared to the cost of conventional face-to-face learning methods. The findings were that online education was found to be cost efficient because

it breaks down geographical barriers to access and minimises time constraints (Porter, Graham, Kristian and Spring & Welch, 2014).

Alexander, Truell, & Zhao (2012) evaluated the expected advantages and disadvantages of online learning. Their study was conducted from the perspective of college students who had never taken online courses previously. The study involved 420 college students undertaking an information systems course who completed an online survey on the perceived advantages and disadvantages of taking online courses. The results showed that a high number of students were of the perception that online learning has more advantages than the traditional face-to-face learning. Talebian, Mohammadi and Rezvanfar (2014) compared the advantages and disadvantages of IT-based education and the implications for students resulting in the identification of the advantages and disadvantages (Talebian, Mohammadi & Rezvanfar, 2014).

Summary

Based on the research analysed above, it has been seen that while there is a wide amount of research available on the different facets of online education, there is considerably less focus on the evaluation of advantages and disadvantages of online learning methodology. This study aims to assimilate the different advantages and disadvantages of the online learning methodology from the perspective of the different stakeholders. Table 1 has been used as inspiration for relating the existing research to the current thesis. It provides a clear demarcation of the scope of the existing research and their related implications. Also, it serves to ensure that the current thesis does not repeat the information which has been identified previously. The questions of the survey have been derived from the literature review. This has been identified as a part of the study of the different topics which require the views of the students.

Table 1: Summary View of Literature Review

Author(s)	Topic	Methodology	Findings
(Al-Alawneh, 2013)	Examining e-learning barriers as perceived by faculty members of engineering colleges in Jordanian universities.	The study relied on a Likert Scale of 36 items where students' perceptions were assessed based on no impact, minor impact, moderate and major impact of online courses. A sample of 176 faculty members were also involved in delivering online courses.	Online degree experience was witnessed for both males and females and that higher education institutions need to have strategic plans that encourage online courses.
(Park & Bonk, 2007)	Synchronous learning experiences: distance and residential learners' perspectives in a blended graduate course.	Web-based collaboration system, conference mediums, 8 students and 4 residential students were interviewed to	Learners value feedback, meaningful interactions with their peers and instructors, but time constraints and language barriers are perceived as challenges.

		identify the benefits and challenges of online learning.	However, there are students who feel they want to connect with their peers and establish some sense of social presence, hence they perceive online learning as a disadvantage.
(Alexander, Truell, & Zhao, 2012)	Expected advantages and disadvantages of online learning: perception is gained from college students who have not taken any online courses.	The study involved 420 college students taking an information systems course who completed online surveys on advantages and disadvantages of taking online courses.	A high number of students were of the perception that online learning has greater advantages. The other finding is that there are significant differences in perceptions among genders.
(Kirtman, 2009)	Online versus in-class courses: an examination of differences in learning outcomes.	The study compared three online courses with three traditional face-to-face courses taught within a period of two years. 71	Same learning outcomes were revealed for conventional and online learning.

		graduates were involved in the study.	

Chapter 3 Methodology
Introduction

The primary purpose of deployment of research methodologies is to develop a framework which can be used to conduct a detailed analysis of the topic. The methodological framework shall consider the different stakeholders of the research. It will also make an effort to derive the research outcomes with respect to the research question and the research objective. This chapter deals with the different methodologies that have been used as a part of this research. Further, the chapter also focuses upon the purpose of each method and the results.

Methodology used

The various kinds of research methodologies that have been deployed in the present study are as follows:

- Literature Review

  A detailed literature review has been conducted in the previous chapter. The research on online education has been analysed for their coverage and effectiveness in regard to the identification of the advantages and the disadvantages of the online learning methodology ("Library guides: Write a literature review: Home", 2018). The primary step deployed in the development of a body of knowledge begins with the analysis of previous research conducted in the area under study in order to discover the extent to which previous research in the field has analysed the same issue ("What is a literature review?", 2018). In the present study, a review of books, theses, and research articles were undertaken to better understand the various facets of online learning research pertaining to the perceived advantages and disadvantages of students. The various dimensions of online

learning that have been studied in detail are: the origin of online learning, the various

types of online learning, the stakeholders of the process of learning, impacts of learning

methodology on the different stakeholders, the advantages and disadvantages of online

learning and its future scope in the arena of learning. Since the present study has focused

on the advantages and disadvantages of online learning, a focus of the review has been on

research in the same area. The keywords that have been used to conduct this study

include: advantages of online learning, disadvantages of online learning, scope of online

learning, stakeholders of the online learning process, stakeholder analysis of the online

learning process.

- Survey conducted as part of the paper-based questionnaires

  The anonymous survey aimed at identifying participant motivators and the points of

  concern in online education. The motivators and the areas of concern were analysed to

  arrive at the advantages and disadvantages of the online learning process, based on

  participants needs (Ponto, PhD, APRN, AGCNS-BC, AOCNS®, 2015). As part of the

  analysis, all the responses were reviewed in detail – this included both singular and

  descriptive answers. Subsequently, descriptive analysis was conducted and produced a

  range of graphs which indicated the weighting and frequency of the respective aspects of

  online education.

- Data Analysis

  The survey data analysis process has been initiated as a quantitative process. On receipt

  of the questionnaire, the participants answered the items in the questionnaire based upon

  their own perception and their own experience. This enabled the researchers to have a

  birds' eye view of the research area ("Data analysis & statistics," 2018). The answers

were analysed comparing patterns that help the understanding of online education. These

patterns were plotted on various graphs (see Chapter 4 Results) to arrive at the

conclusions and their related inferences. The process adopted for the purpose of data

analysis is as follows:
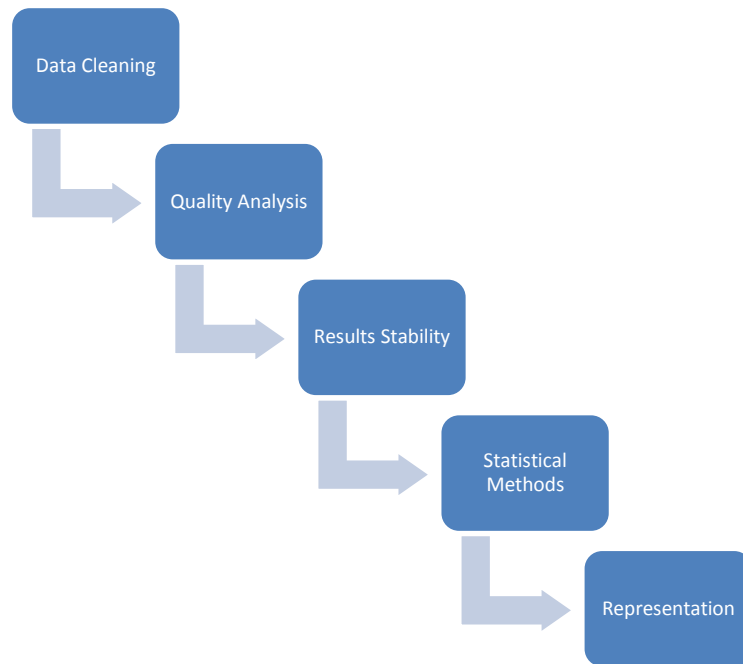
Figure 3.1: Process of data analysis

Purpose of the Study

Based on the literature review, it was seen that while there is extensive research produced

on the topic of online learning, the analysis of the advantages and the disadvantages of online

learning is quite limited.

The main purpose of this research is to identify a sample space of respondents who will

be able to facilitate the analysis of the advantages and disadvantages of online learning. The

study aims to understand these advantages and disadvantages from the perspective of students in

New Zealand vs the Kingdom of Saudi Arabia.

Research Methodology and Justifications

Research Approach

This study has used a mixed method approach to investigate the advantages and disadvantages of online learning for students in New Zealand, based on their experiences using online learning.

A mixed methods approach integrates quantitative and qualitative data collection and analysis (Johnson, Onwuegbuzie, & Turner, 2007). The aim of this approach is to provide the most comprehensive insight into a research issue. This study used a survey containing a mix of open-ended and close-ended questions. This survey started with some quantitative close-ended questions to enable the outcome of the research to be generalised to a wider student population and then incorporated qualitative, open-ended questions to gather detailed opinions from the participants (Creswell, 2014).

The study employed a survey, interviews and data analysis. The study involved 35 students from a local university in New Zealand, independently participating in the survey of their own accord. A mixed approach of literature review, interviews and survey data analysis has been used to form the study focused on the advantages and the disadvantages of the online learning system.

Justification

The advantages and disadvantages that were to be collected were expected to be somewhat varied, situated and highly subjective in nature. They were also expected to vary hugely from element to element (Kumar, Karabenick, Warnke, Hany & Seay, 2018). Hence, it was crucial to have an extensive idea regarding the perspective of the different elements of the sample space. In this case, a short questionnaire of 15 questions had been prepared and was a mix of objective and elaborative questions. The descriptive answers also needed to be precise

and small. The total time duration of the survey, for each of the respondents, was anticipated to

be approximately 30 minutes. Each of the survey respondents was invited to a secluded room

where they were requested to fill the responses to the expected queries. This created an answer

bank of responses, based on the conclusions in the present study from which they have been

drawn.

Survey

The survey is a useful tool which is used to gather the views of the participants with respect to a
particular topic.

The Instrument

The survey instrument was a paper-based questionnaire. One of the critical aspects was

the development of the questionnaire for the participants. The questionnaire allowed the students

to respond at their own pace, in their own time. An effort was given to conduct the survey in a

flexible, engaging and interactive manner (van den Berg et al., 2011). The questionnaire focused

on a lot of learning facets like usability, sanctity and user-intuitiveness (Ebert, Huibers,

Christensen & Christensen, 2018). The total sample size of the survey was 11. The survey

sample was selected based on the diversity of the student members at the university where and

advert to participate was placed. The selection was conducted in a random manner. The intended

sample size for the survey was identified as 30 members. There were about 170,000 university

students within New Zealand in 2015. This includes 49,400 post-graduate students which

comprised of about 29%. While over 43,000 students graduated from the New Zealand

Universities every year, 90% of them graduated at bachelor's level or above ("Key facts |

Universities New Zealand - Te Pōkai Tara", 2019).

As a part of Chapter 4 of the research, a detailed analysis was conducted of the responses

received for each question. The objective answers were analysed in the form of pie charts to give

an idea of the perception of the respondents. However, the descriptive answers were handled

quite differently. These were studied in detail to derive the key points of the comments and the

salient points were consequently derived. The graphical and analytical analysis was conducted

on the derived salient points only.

From the perspective of the research, the advantages and disadvantages of online learning

have been derived from the responses. These aspects have been discussed in detail in Chapter 5

of the paper.

Self-Administered Survey
The survey was conducted in a self-administered manner. This implies that the survey has

not been conducted under the aegis of an invigilator. Rather, the respondents have ensured by

themselves that they have submitted the appropriate answers.

Survey Design
The survey was designed to be user-friendly and user-intuitive. It was hoped this would

ensure that the respondents would be able to fill the responses on their own and not require the

assistance of any other to explain the details of the questionnaire (van den Berg, et al., 2011).

Data Collection
Although an online survey was considered, the data was collected in a manual manner as

the questionnaires were in a paper-based form.

Structured Interviews
The technique of structured interviews were deployed to gain a detailed understanding of the

topic with respect to the students who are in the arena of learning. This aspect deals with the

learning motivators and challenges encountered by these learners.

Data Analysis

Figure 3.2 illustrates the process of data analysis for this research. The following steps were adopted to analyse the data:

- Preparation of the data and cleaning

- Review and exploration of the data

- Analysis of the data

- Representation of the data [See Chapter 4 for results]
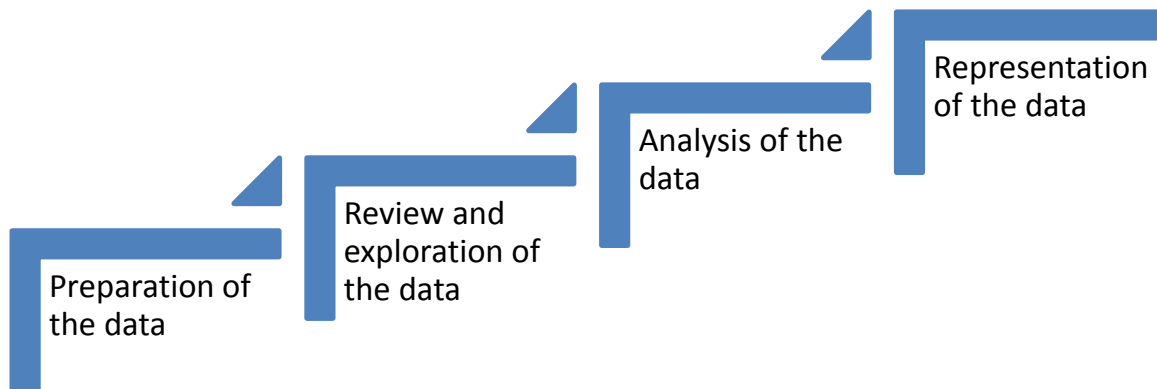
Figure 3.2: Mixed methods of analysis

("Analyzing mixed methods data – Center for Innovation in Research and Teaching," 2018)

Ethical Considerations

The ethical aspects of the research were considered and addressed with respect to the utilisation of human subjects for the purpose of data analysis and research. Each of the respondents has participated of his or her own accord voluntarily as evidenced by their signature on a consent form or by participation in a survey. All respondents provided their written consent, to allow the publication of the results that have been derived out of their responses. The respondents were given an information sheet at the outset detailing the procedures of the research and the potential risks that might incur. The results of the research have been presented in such a manner that the confidentiality and the anonymity of the respondents has been maintained.

Summary

The research and survey on the topic have been conducted on the basis of the interviews and interactions with the students and instructors who are involved in the process of online learning. The primary reason for the selection of this target group is that, these entities have already had ample experience in the field of online learning, which will have enabled them to provide inputs regarding the advantages and the disadvantages of the online learning process. The respondents provided their inputs in the pre-determined interview questionnaire format. This enabled the analysts to derive the trend of the data in a structured format. The literature review formed an essential role in the creation of the survey and the identification of the questions which were to be asked as a part of the semi-structured interview.

Chapter 4 Results

Introduction

This chapter presents the results from the survey and interviews undertaken in the present study. These results have been obtained after gathering data from the survey and interviews, the details being presented from both a qualitative and quantitative perspective. The paper has been structured by presenting the quantitative analysis first, followed by the qualitative.

Data Analysis and Representation

Data forms a quintessential part of research and analysis. The entire spectrum of the research is based on the effective utilization of the data. Hence, the processing of the data plays an important role. This section comprises of the different aspects of data preparation and cleaning, preparation of the data, analysis of the data and the representation of the data.

Data Preparation and Cleaning

The responses presented in this chapter were prepared with the use of a pseudonym *participant* followed by a corresponding number instead of using identifying names for each of the respondents. This assisted the researcher in reducing the potential for bias. To also protect the confidentiality of the respondents the identity of the students was not disclosed. The responses to the descriptive questions were analysed in detail for the actual intent of the respondents and classified into broad categories. This was used to assimilate the data in a quantitative manner and identify a trend. The questionnaire was designed in a part-objective and part-descriptive manner. Objective answers can be placed in the analysis templates in a very outright and easy manner. A pilot survey was conducted to improve the effectiveness of the questionnaire.

Preparation of the data

In terms of preparation of the data, the question set is identified and analysed. The objective questions are taken at face value. However, the descriptive responses are converted

into a suitable atomic response format ("What is data preparation? | Datawatch," 2018) – review

and exploration of the data. The data is converted into graphs and tables for better visibility.

Analysis of the data

The data is analysed on the basis of the responses that were received from the

respondents. The primary purpose of the analysis was to identify the terms participants used for

the advantages and disadvantages of online learning. In this respect, the objective responses were

analysed in a straightforward manner by placing the multiple value questions on bar graphs and

the dual value questions on pie charts.

Representation of the data

The received data was converted into the respective advantages and disadvantages of

online learning. While the questions related to the advantages and disadvantages yielded direct

responses, the other questions like the technological requirements and the risk of cheating served

to support the data.

Results

This section details the results. As a part of this section, two data collection techniques are

presented – survey results and interview results. While there were 35 participants in the survey,

the results have been embedded into the results where each of the pertinent themes are presented.

Presentation of Semi-structured Interview Results

The semi-structured interviews are conducted to get an idea about the topic from the entities who

have an experience in the arena.

Do modern young learners recognise online degrees?

Table 2: Recognition of online degrees

Sl No	Respondent Name	Response
1	Participant 1	Yes
2	Participant 2	No
3	Participant 3	No
4	Participant 4	No
5	Participant 5	Yes
6	Participant 6	No
7	Participant 7	Yes
8	Participant 8	Yes
9	Participant 9	No
10	Participant 10	No
11	Participant 11	Yes
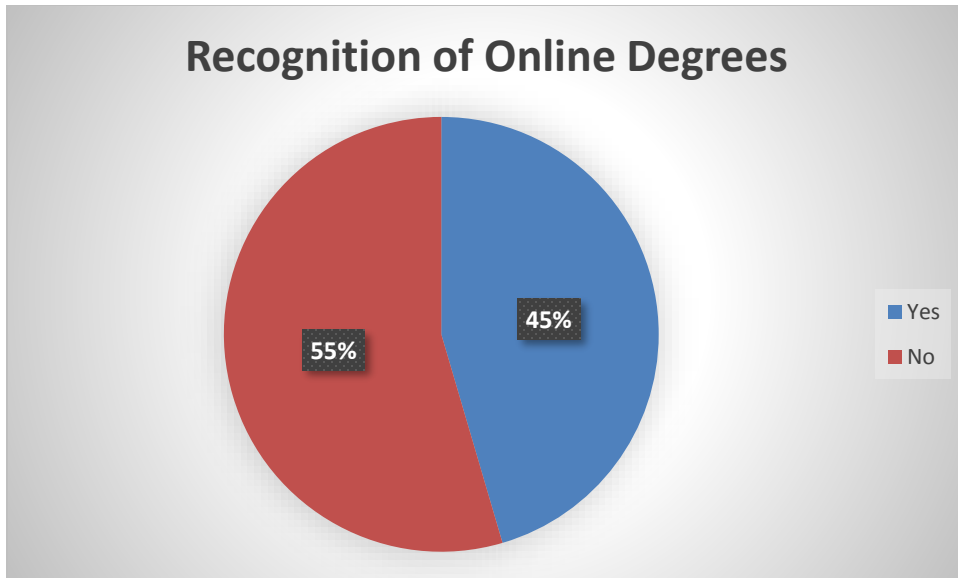
Figure 4.1: Recognition of online degrees

Do you perceive online learning as superior to conventional learning?

Table 3: Comparison of learning superiority

Sl No	Respondent Name	Response
1	Participant 1	Yes
2	Participant 2	No
3	Participant 3	No
4	Participant 4	No
5	Participant 5	Yes
6	Participant 6	No
7	Participant 7	Yes
8	Participant 8	Yes
9	Participant 9	No

10	Participant 10	No
11	Participant 11	Yes

Quantitative Analysis	Number of Yes	Number of No
	5	6
Percentage	Percentage of Positives	Percentage of Negatives
	45.45	54.55
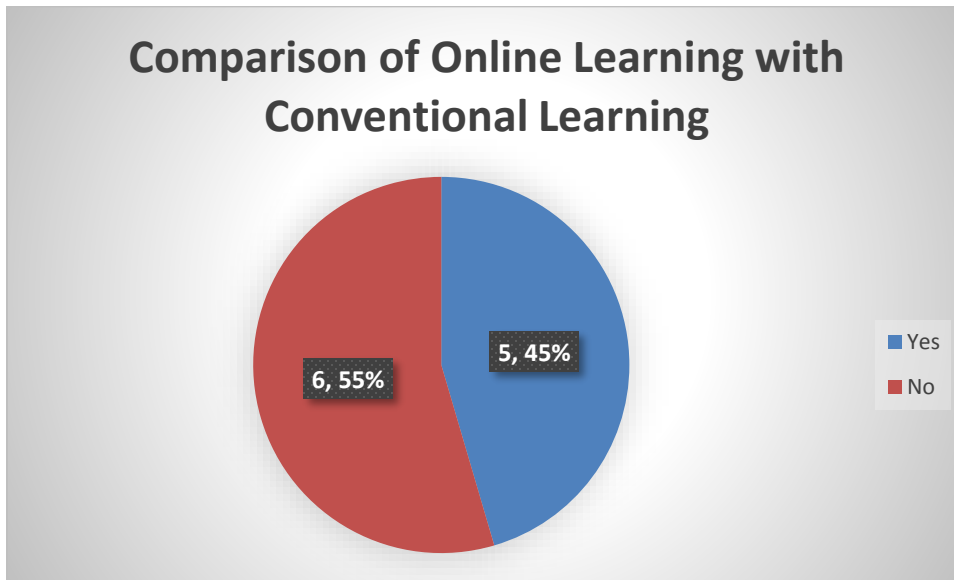
Figure 4.2: Comparison of Online Learning with Conventional Learning

1. How does online education work on a daily basis?

60% of respondents were of the opinion that online education can be conducted from the comfort of their homes; the timing of the online courses could be selected by the learner; the basic amenities required were that of a computer, a speaker and head phone and a steady internet connection. It was not considered possible to adopt online education without a stable internet connection.

40% of respondents were of the opinion that the online learning process was carried out from the online learning facility of the other universities. The timing was fixed. The infrastructure requirements were provided by the university from where the classes are carried out.

2. Is it possible to earn online degrees in disciplines like engineering and nursing?

Table 4: Role of online learning in practical studies

Sl No	Respondent Name	Response
1	Participant 1	Yes
2	Participant 2	No
3	Participant 3	No
4	Participant 4	No
5	Participant 5	Yes
6	Participant 6	No
7	Participant 7	Yes
8	Participant 8	Yes
9	Participant 9	No
10	Participant 10	No
11	Participant 11	Yes

Figure 4.3: Implementation of online learning in the practical fields

3. Is online education prone to cheating?

Table 5: Perceptions of cheating in Online Education

Sl No	Respondent Name	Response
1	Participant 1	No
2	Participant 2	Yes
3	Participant 3	Yes
4	Participant 4	Yes
5	Participant 5	No
6	Participant 6	Yes
7	Participant 7	No
8	Participant 8	No

9	Participant 9	Yes
10	Participant 10	Yes
11	Participant 11	No
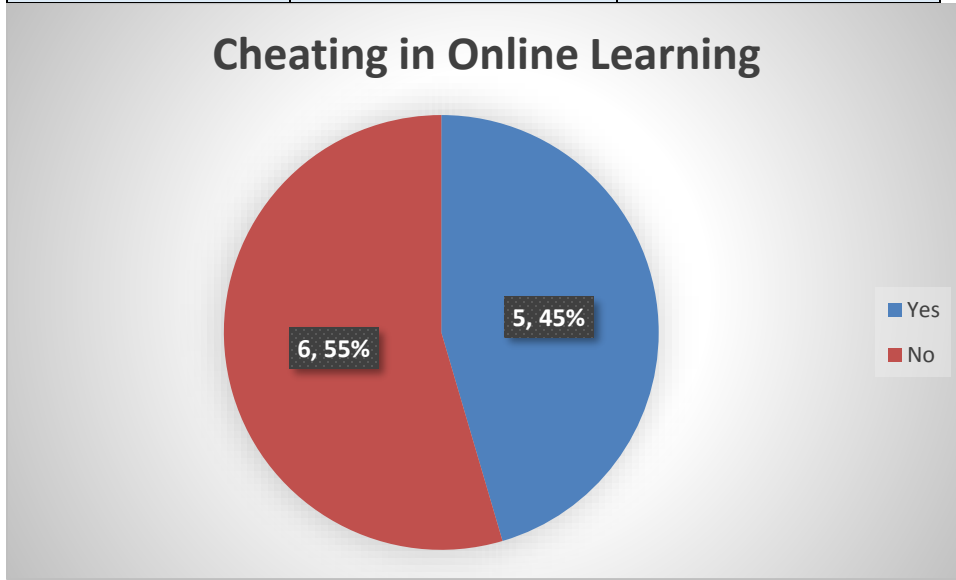
Figure 4.4: Perceptions regarding cheating in online learning

Presentation of Survey Results

The presentation of the survey results will provide a quantitative idea on the different

facets of the research. In this case, the primary aspect has been the understanding of the

advantages and disadvantages of online learning. The key takeaways of the survey results are as

follows:

Sl No	Advantages of Online Learning	Disadvantages of Online Learning
1	Self-paced	Difficult to clarify
2	Lack of geographic limitations	Lack of interaction
3	Can take up other jobs	Lack of follow up
4	Time saving	Plagiarism
5	Lack of language boundaries	High difficulty level
6	Low Cost	Isolation

| 7 | | Technical Issues |
| 8 | | Dependency on internet |

1. How do you tell if online education is fit for aspiring students?

70% of the respondents found that the domain of online learning was very fit for aspiring

students owing to the flexible nature of the learning platform. Further, it instils the values of

responsibility, time management and proactiveness. 30% of respondents were sceptical regarding

the learning platform as they were concerned about the possibility of employability and the

quality of learning. The focus of the learners was in the arena of course delivery, material

availability and the evaluation of the learners.

2. How is the credibility of the online courses tested?

Methods identified included case study assessments, online multi-choice questions,

implementation of evaluation modules, and the implementation of monitored exams.

3. Are there any differences in the support services provided for the online and conventional

    learning methods?

Table 6: Perceived differences between online and conventional learning support

Sl No	Respondent Name	Response
1	Participant 1	Yes
2	Participant 2	No
3	Participant 3	No
4	Participant 4	No
5	Participant 5	Yes

6	Participant 6	No
7	Participant 7	Yes
8	Participant 8	Yes
9	Participant 9	No
10	Participant 10	No
11	Participant 11	Yes
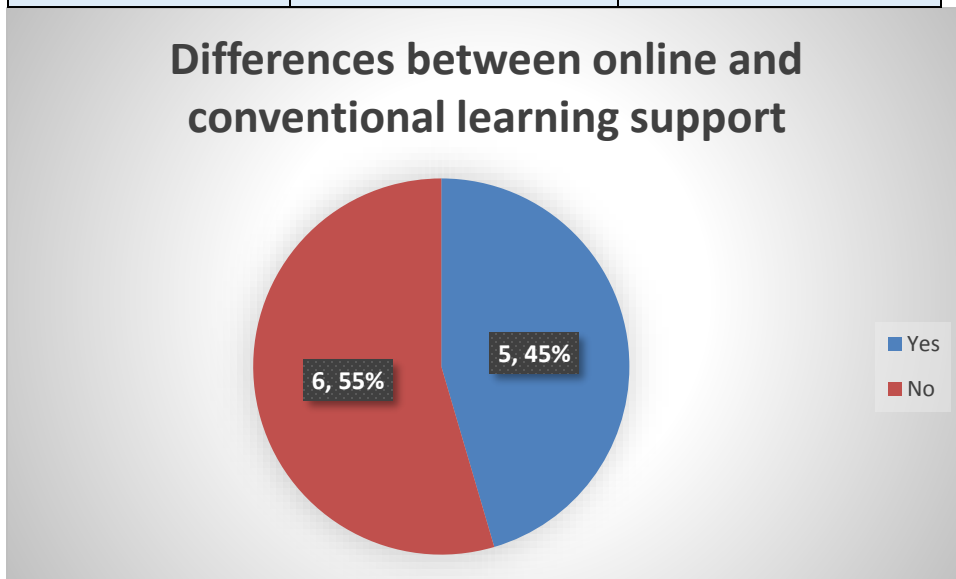
Figure 4.5: Differences between online and conventional learning support

.

4. What are the technological requirements of the online learning process?

Table 7: Technological requirements for online learning

Sl No	Respondent Name	Response
1	Participant 1	e-Books, Video Lectures
2	Participant 2	Internet, Software, Computers

3	Participant 3	Not Answered
4	Participant 4	Internet Connection, Computers
5	Participant 5	Internet, Software, Computers
6	Participant 6	Internet, Software, Computers
7	Participant 7	Computers, Video Lectures, Smart phones
8	Participant 8	Tablet, Smart Phones, Laptops
9	Participant 9	Internet, Software, Computers
10	Participant 10	Internet, Software, Computers
11	Participant 11	Helpdesk

Table 9: Technologies needed by participants

Technology	Number of positive respondents	Percentage Positives
e-Books	1	9.09
Video Lectures	2	18.18
Internet Connectivity	6	54.55
Computers	7	63.64
Smart Phones	2	18.18
Helpdesk	1	9.09
Software Applications	5	45.45
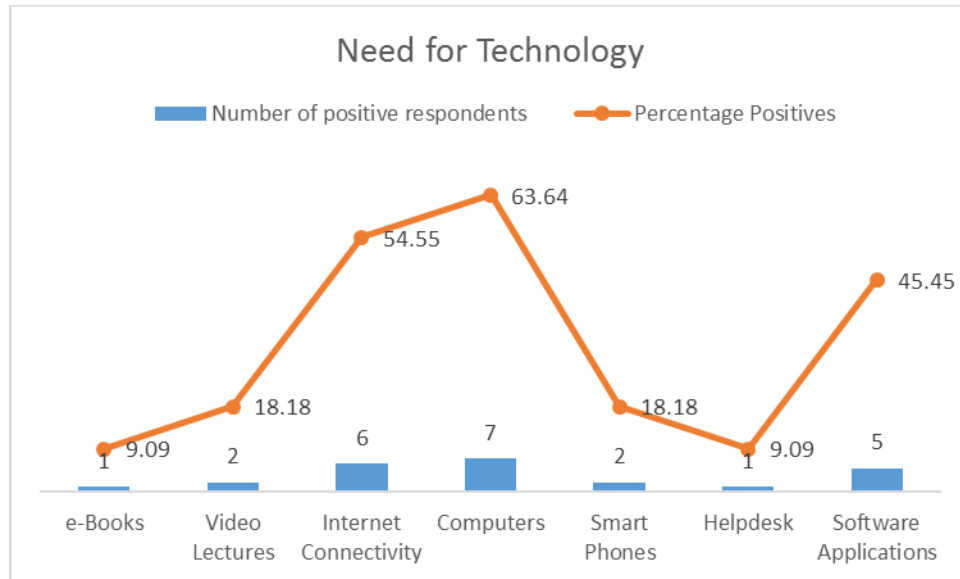
Figure 4.6: Need for technologies

5. What do you think are the advantages and the disadvantages of the online learning

   process?

Summarised in Table 9 and 10, the following advantages and disadvantages were highlighted by

the respondents:

Table 9: Advantages of online education

Advantages of Online Learning	Number of Respondents
Ability to take up other kinds of jobs	4
Choice of learning	1
Cost effectiveness	3
Ease of access	11
Fast learning	1
High levels of confidence	1
Anytime anywhere learning	8
Reduced pressure	1
Saves time	5

Table 10: Disadvantages of online education

Disadvantages	Number of Respondents
Difficulty in sticking to the schedule	1
Health problems	1
Lack of clarification in a timely manner	5
Lack of experience on the part of instructors to deal with online courses and international students	1
Lack of face-to-face interaction	5
Lack of interaction with the tutor	2
Lack of monitoring	1
Lack of motivation	3
Need for technology	2
Plagiarism	2
Plagiarism and cheating	1
Reduced reliability	1
Reduction of job opportunities for the teachers	1

Summary of disadvantages

Most of the learners have issues with the need for technology in the implementation of

the online learning process. For that matter, it was considered pivotal that prior to embarking

upon the process of online learning, the learner should be equipped with the required technology

entities such as internet connectivity and computers. On the part of the content providers, it is

vital that they ensure to establish an easy-to-use helpdesk for the purpose of resolution of the

queries posed by the learners. This is essential because the learners are not highly sophisticated

in most cases. They would therefore require the assistance of a helpdesk in that case.

Summary of advantages

One advantage that has been highlighted for the user is ease of communication. First, this

ensures that the shy and non-English speaking students can also contribute to and receive from

the process of online learning. Second, compared to the traditional learning resources, it is easier

to find required information from the available online resources. Third, it has been stated by the

respondents that the learners undergoing online learning can also become involved in other

activities such as part-time income. This provides a vital area of earning and support for the

learners. It would also enable the learners to choose the subjects, based upon their areas of

interest. This creates an avenue for need-based learning and development as opposed to the

conventional curriculum-based learning and development.

Summary

The primary focus of this chapter has been to segregate the objective questions from the

descriptive questions. At the outset, the responses to the objective questions were assembled and

plotted on the graphs and pie-charts. Subsequently, the descriptive questions were analysed,

cleaned and plotted on the graphs. The primary focus of the chapter has been the identification of

the advantages and the disadvantages of online learning. Based on the analysis, it can be seen

that ease of access to the learning modules and the supporting data and the ability to conduct the

process of learning in an anytime, anywhere manner have emerged as the most relevant

advantages of the process of online learning. In terms of the disadvantages, the lack of timely

clarifications, the lack of face-to-face interactions and the reduced levels of motivation, have

emerged as the most significant disadvantages of online learning, with respect to the conducted

survey. An additional factor which has emerged as a part of this survey is that of the

technological needs that are required to implement the process of online learning.

Chapter 5 Discussion

Introduction

The domain of online education has emerged because of the evolution of the overall

arena of education. The previous research has described the need for online education, its

evolution and the path that it has been transgressing since then. During the literature review and

the research conducted as a part of the preparation of this thesis, it has been seen that the existing

research failed to provide a structured presentation of the advantages and disadvantages of online

education, thereby leading to the absence of a canvas for the comparison of the existing modes of

learning. This chapter presents the comprehensive results that have been obtained from the

different methods implemented to conduct the research. As part of the mixed-methods analysis,

the qualitative and quantitative methods of analysis have been implemented. The chapter

presents a comprehensive analysis of the details that have been found as a part of the present

research compared to what was already known with regard to the research problem; that is the

identification of the advantages and disadvantages of the online learning methodology. While the

research scope has been limited to the understanding of the advantages and disadvantages of

online education, the research has thrown various key relationships between the facets of online

education and the advantages and disadvantages of online education. Awareness regarding the

domain of online education is quite prevalent. Hence, this research does not promise to throw

any new discoveries into light. However, it is expected to play a key role in assimilating the

advantages and disadvantages of online education in a comprehensive and structured manner

which can be leveraged in the arguments for or against the domain of online learning. The

chapter has been structured into two clear demarcations. In the first section, the chapter focuses

upon the study of the advantages and disadvantages of online learning while the second section

establishes a relationship between the factors unraveled by the thesis and the current situation in

the online learning domain in Saudi Arabia.

Participants Profile

The participants who have contributed to the study have been mapped in the arena of 6

countries where the overall space has been dominated by male participants in the age group of

18-24 years. 90% of the respondents belong to the educational level of Diploma and Bachelors.

The core area of research of the participants has been restricted to the arena of online learning

and its related advantages and disadvantages which have the potential to impact the arena of

growth or resurgence of the online learning module. The contribution of the participants has been

found to be largely influential in the arena of online learning in the arena of higher education.

These views have proven to be highly instrumental in identifying the key advantages and

disadvantages of the arena of online learning with respect to the overall scope of learning and

development. Going by the distribution of the profile of the participants, the views of the

participants have been given maximum weighting in the identification of the advantages and the

disadvantages of the online learning domain. The individual views of the participants have been

considered quintessential in this exercise. The analysis of the participants profile is solely

focused upon the identification of the learning items from the present research. This has no

bearing upon the learning that has been conducted from the previous researches.

Advantages of Online Learning

- Ability to take on other jobs

A moderate number of respondents (11%) have mentioned the benefits of the adoption of

online education in terms of inculcation of additional job opportunities. The additional job

opportunities act in the manner of additional income for the online learners. In addition, it has

also been seen that the adoption of online learning allows the learners to continue with their

existing jobs.

- Choice of learning

Although the ability to choose the syllabus has been mentioned as an advantage by the

respondents, it does not have many arguments in its favour. This can be attributed to the fact that

the conventional learning modules within the brick-and-mortar classrooms also allow flexibility in the choice of curricula to the learners. In both the cases, the learners have the ability to choose their own disciplines.

- Cost effective

The respondents have highlighted the advantage of cost-effectiveness. This advantage has emerged as a resulting product of two other benefits, namely anytime, anywhere access and the ability to take on other jobs. The mode of online learning offers the benefit of cost-effectiveness in a two-pronged manner. While it supports supplementary income on one hand, it also encourages the reduction of expenses by facilitating anytime, anywhere access to the educational platform. This is a useful conjecture as it has multiple implications. Importantly, it promises to be the answer to the problems of the working section of the learners group who are in a dilemma regarding the discontinuation of their jobs to undertake further learning. However, the adoption of online learning promises the derivation of benefits from further studies while negating the need for the removal of the learners from the workforce. In addition, the adoption of online learning as opposed to the conventional mode of learning is based on the primary advantage of anytime, anywhere learning. This leads to a huge reduction in expenditure due to the elimination of travel needs. This has led to an overall reduction in expenses for the learners. Although there is a strong argument in favour of wide availability of the course materials, the same advantage is also applicable to the conventional mode of learning. Hence, the related advantage has been eliminated from the thesis. The reduction in the cost required is closely related to the response regarding the anytime, anywhere flexibility of the online mode of learning. 60% of the learners have responded in favour of enhanced flexibility in terms of geography and time. This implies a reduction of cost also. The conventional mode of education requires the presence of the learners

and the instructors in one place. This includes the basic requirement of travelling which incurs

cost, based on the actual location of the learner (Chen, Fang, Fan, Edwards & Zhang, 2017).

Upon the same lines, the instructor does not need to travel to the physical classroom; they can

deliver the lecture from any location. In addition, the role of the instructor has been hugely

transformed in the case of online learning. In this case, the role of the instructor has changed

from that of the single source of provider to a facilitator. This has transformed the arena of online

education completely (Deming, Goldin, Katz & Yuchtman, 2015). Irrespective of the use of any

of the above mediums, the ease of access to the online resources has been increased manifold. As

an added convenience, it has become very easy to share the resources ("What is content

management system (CMS)," 2018).

- Ease of access

    Ease of access has emerged as the most common advantage imparted by the online

learning methodology. 60% of respondents were of the opinion that online education can be

conducted from the comfort of their homes; the timing of the online courses could be selected by

the learner themselves. The basic amenities required were that of a computer, a speaker and

headphone and a steady internet connection. It was not considered possible to adopt online

education without a stable internet connection. The remaining 40% were of the opinion that the

online learning process was carried out from the online learning facility of the other universities,

where the timing was fixed. The infrastructure requirements were provided by the University

from where the classes are carried out. Hence, it can be deduced that the primary concern of ease

of access has been dominated by the inclusion of the factors of travel time, time spent due to

learning and the technological requirements. As part of the asynchronous mode of learning, the

learner shall be able to access the materials based on their point of interest. There is no

compulsion with regard to the exact time of learning and pattern of learning ("The benefits and drawbacks of online learning," 2018).

- Fast learning

Online learning has been touted as a faster learning methodology by the respondents. 50% of the respondents have agreed that the mode of online education will be accepted across the globe in future.

- High levels of confidence

As per the survey, the adoption of online learning has led to higher levels of confidence amongst the learners who are not very adept with communication skills. This can be attributed to the lack of a requirement to interact face-to-face which is a reason for an increase in peer pressure and dominance.

- Anytime, anywhere access

Online learning systems also promote an improved level of communication between the learners. It offers the students, who have relocated to distant geographies, an opportunity to complete their educational process. The most important role is played by asynchronous communication that is conducted (Waters, 2012). The ability to conduct the process of learning in an anytime, anywhere mode has been facilitated due to the web-based presence of the medium. The research has been successful in establishing a connection between the technological requirements of the methodology to derive the benefits of anytime, anywhere access.

- Reduced pressure and stress

The respondents have highlighted the presence of a reduced level of stress due to the adoption of online learning. This has been raised by over 30% of learners.

- Saves time

Online learning systems also promote an improved level of communication between the learners. It offers the students, who have relocated to distant geographies, an opportunity to complete their educational process. The most important role is played by the asynchronous communication that is conducted (Waters, 2012).

Disadvantages of Online Learning

- Difficulty in sticking to the schedule

The present research has depicted the perspective that there are chances of schedule slippage due to the adoption of the online learning methodology. The lack of face-to-face interaction and the absence of follow ups from the instructors can be identified as the reasons for the same. However, there is a strong argument against this conjecture as the online learning curricula is highly structured and digital in nature. This ensures that the learners receive regular and automated follow ups by e-mail. This ensures that schedule slippage is steeply reduced ("9 steps to overcome the biggest obstacle to learning: Time | Udemy for Business," 2018).

- Health problems

Health problems incurred due to the continuous interaction with digital systems have been highlighted by the respondents of the surveys. As per the analysis, it has been seen that the technological requirements of the online learning methodology are that of laptops, computers and internet connections. These devices have been known to cause various kinds of ergonomic and ENT health hazards (Pantic, 2014).

- Lack of clarifications in a timely manner

Lack of timely clarifications have been raised as the most prominent disadvantage as a part of this survey exercise.

- Lack of experience on the part of instructors to deal with online courses and international students

The lack of experience on the part of the instructors to deal with the international

students, have also been raised as a crucial disadvantage.

- Lack of face-to-face interaction

The process of online learning is strongly dependent upon a stable internet connectivity.

The strong internet connectivity that has been mentioned in this case, refers to the internet

connectivity at the server end and the internet connectivity at the client end. At the server end,

the internet connectivity is required to ensure that the content is delivered from the server in a

seamless manner. As part of this connectivity, it is crucial to maintain a high-speed connectivity

to deliver the content in an efficient and stable manner. Further, the importance of a seamless

delivery cannot be negated. This has a high impact upon the efficiency of the learning

methodology. It plays a crucial role in ensuring that the interest of the learners is retained. In

competition with the conventional mode of learning, the online learning methodology loses out.

This is because the conventional mode of learning is completely devoid of the need for any kind

of internet technology. Similarly, in the context of internet connectivity at the client end, it is

pivotal to maintain a high-speed link to deliver the content in an efficient and stable manner

(Rosalia, 2014). Learners value feedback, meaningful interactions with their peers and

instructors but time constraints and language barriers are perceived as challenges. However,

there are students who feel they want to connect with their peers and establish some sense of

social presence hence they perceive online learning as a disadvantage (York & Richardson,

2012). Similarly, in the context of internet connectivity at the lecturers end, it is pivotal to

maintain a high-speed link to deliver the content in an efficient and stable manner (Ippakayala &

El-Ocla, 2017). Keeping the different cases in view, the hybrid learning mode presents itself as an ideal mode of learning (Yuan & Kim, 2014).

- Lack of interaction with the Tutor

    The lack of interaction with the tutor has been closely related to the disadvantage of lack of face-to-face interaction. This implies that the intervention of technology is higher than the impact of human intervention leading to a strong reduction in social interaction.

- Lack of monitoring

    The survey has highlighted that the chances of cheating are higher in the case of online learning as compared to that of the conventional mode of learning. It can be deduced that the presence of cheating is possible due to the lack of monitoring. This supports the idea that lack of monitoring is a disadvantage in the online learning methodology.

- Lack of motivation

    The various factors impacting the online learning process are that of the lack of motivation or drive which is usually derived from the interaction with other communities (Liu, Chen, Sun, Wible & Kuo, 2010).

- Need for technology

    The process of online learning is strongly dependent upon a stable internet connectivity. The strong internet connectivity that has been mentioned in this case, refers to internet connectivity at the server end and the internet connectivity at the client end. At the server end, the internet connectivity is required to ensure that the content is delivered from the server in a seamless manner. As part of this connectivity, it is crucial to maintain a high-speed connectivity to deliver the content in an efficient and stable manner. Further, the importance of a seamless delivery cannot be negated. This has a high impact upon the efficiency of the learning

methodology. It plays a crucial role in ensuring that the interest of the learners is retained. In competition with the conventional mode of learning, the online learning methodology loses out. This is because the conventional mode of learning is completely devoid of the need for any kind of internet technology. Likewise, in the context of internet connectivity at the client end, it is pivotal to maintain a high-speed connectivity to deliver the content in an efficient and stable manner (Hoffmann & Lutz, 2014). Similarly, in the context of internet connectivity at the client end, it is pivotal to maintain a high-speed connectivity to deliver the content in an efficient and stable manner (Odigie & Gbaje, 2017).

- Plagiarism and cheating

About 11% of the respondents have reported that the presence of plagiarism and cheating acts as a negative factor in the evaluation of the learners in the online learning process. Rovai has emphasised the key facets of the assessment of learners in the domain of online learning. These factors include proctored testing, identity security, academic honesty and the use of online forums for the purpose of assessment and communication (Rovai, 2000).

- Reduced reliability

Although reduced reliability has been raised as a disadvantage by a small number of respondents, it is however a matter of serious concern as the effectiveness of any initiative can only be judged by the reliability measurement. Taeho and Richardson have developed an effective instrument for the measurement of the effectiveness of the online learning process. This model, known as the Student Online Learning Readiness (SOLR) model has been deployed for research purposes. However, there is a need also for the deployment of a similar model for the measurement of large-scale initiatives (Yu & Richardson, 2015).

Overview of Online Learning in Saudi Arabia

Role of online learning in Saudi Arabia

Based on the responses to the question "Do modern young learners recognise online degrees?" it can be seen that 50% of the respondents considered that the aspect of online learning is quintessential to the future of learning and development. In fact, 50% of the respondents agreed that the process of online learning is superior to conventional education also. The domain of online learning requires the inclusion of a stable information technology infrastructure. The technological network of the Saudi universities allows for the provisioning of the required infrastructure for online learning. The Unified Theory of Acceptance and Use of Technology has been deployed in the Universities of Saudi Arabia (Al-Gahtani, Hubona & Wang, 2007).

Advantages of shifting current Saudi e-learning to cloud

Since 50% of the respondents agree that the mode of online learning can be executed from the comfort of their home, one of the prime applications of cloud technology lies in the educational sector. This application of the cloud is known as the educational cloud. In the university sector, cloud computing provides access to a wide range of academic capabilities and educational tools. As a part of this model, a major part of the technology requirement such as storage could be shifted to the cloud. It imparts a learner-centric view for the education and learning platform (Wong, 2011).

Role of social presence in the online learning environment

Social presence has been identified as a critical factor in the determination of the impact of online education. However, the existing research has not been able to identify the impact of online learning on the different stakeholders (Tu, 2002). The impact of the internet on the online learning mode has been found to be significant. 50% of the respondents have expressed the need for a stable internet connection during the process of online learning. It has been used as a

facilitating mechanism for the purpose of course delivery and technology support unit (Bryceson, 2015). However, there are many design challenges which need to be considered while formulating the collaborative environment for the online learning function (van Joolingen, de Jong, Lazonder, Savelsbergh & Manlove, 2005; Thomas & Thorpe, 2018). The domain of e-books and video lectures have been considered to be amongst the most important things required for online learning. Since the video lectures are widely provided through the platform of YouTube, it entails the need for a widespread social integration to view and share the videos, which would also be able to benefit the other learners.

The key contributions of this research are as follows:

(1) The core advantage of the online learning methodology is the ability to conduct the online learning process in an anytime, anywhere mode. This leads to implied advantages such as cost saving, time saving, stress reduction and so on.

(2) The other key advantages include the ease of access to the learning resources and the ability to be involved in a job even while undergoing the learning process.

(3) The core disadvantages lie in the arena of the lack of any kind of face-to-face interaction with the other stakeholders in the process, the delay in the process of clarification of the issues and the reduction in the levels of motivation of the learners.

(4) The research has also stated that technology would play a quintessential role in the area of online learning.

Summary

As a summary, it can be seen that the online learning domain has prime advantages in the arena of ease of access and the ability to access the learning modules on an anytime, anywhere

model. This adds the increased flexibility of reduction in cost, reduction in pressure and savings

in terms of time and effort. Further, the disadvantages lie in the area of the lack of a model to

receive clarifications from the instructors immediately, as in a conventional classroom model.

Further, a reduced level of motivation and the lack of face-to-face interaction with the instructors

and the other learners have also been reported as major disadvantages. The limitations of the

study are that the research is solely based on the perceptions of the user. The real-world scenario

has not been considered in the domain of analysis and research. In addition, the entire scope of

learning has been restricted to the context of the learners and the instructors only. The theoretical

contribution of this research has been the identification of the advantages and disadvantages of

online learning. The practical contribution of this research has been the identification of the

causes because of which the level of employment of online learners is low.

Chapter 6 Conclusion

The paper has made significant progress in the area of online learning. During the process of research, it was seen that research on the field of the definition and the facets of online learning are numerous. However, the literature regarding the advantages and the disadvantages of online learning were extremely limited. A significant amount of effort was devoted to the domain of online learning in Hamilton, New Zealand versus the scope of online learning in Saudi Arabia. The contrast between the two spheres of influence has served to provide a contrasting platform, which has facilitated an understanding of the advantages and disadvantages of online learning, from both perspectives. The primary edifice of the research was based on the precincts of literature review and surveys. The process of literature review provided an insight into the different areas of online learning including an analysis of the different stakeholders, their perspectives and the advantages and disadvantages from the perspectives of the stakeholders.

The research has been conducted in a sequential manner. At the outset, a literature review was conducted on the different aspects of online learning. Subsequently, the different methodologies were considered as part of the detailed research. In the next section, the derived data has been analysed. The discussion chapter provided an overview of the derivations of the entire research. Finally, the conclusion chapter summarizes the details of the research. This thesis has focused upon the identification of the different stakeholders and the advantages and disadvantages of online learning with respect to the perspectives of the student and instructor stakeholders. In regards the results received from the survey, it can be seen that the role of technical infrastructure and internet connectivity is paramount to ensure the success of the online learning methodology. Further, content and technology providers must provide portable, high-quality, interoperable solutions so that the same content can be ported across the different

institutions and the different departments of the same institutions. This will encourage the online

learning centres to avail the certifications (Polidoro, 2013). The affiliation of the institutions

provides a degree of credibility to the certificates received as a part of the online learning

platforms. An understanding of the process of online learning will facilitate the institutionalising

of the processes which would lead to overcoming the disadvantages. Further, the advantages can

be leveraged to receive a two-phased benefit. First, it shall prove itself as an effective

justification to popularise the ventures of online education. Second, the identification of the

advantages shall create an opportunity to identify the best practices in the online learning

platform.

Future Scope

Based on the results of this study, it has been seen that the concerns have been raised in

the area of plagiarism, cheating, need for high-end technology and the lack of an appropriate

monitoring framework and an effective assistance framework. It is essential to identify a

comprehensive framework for the deployment of online learning in a collaborative way.

Limitations

The research has certain limitations which need to be addressed. First, the research is

solely based on the perceptions of the user. The real-world scenario has not been considered in

the domain of analysis and research. Second, the entire scope of learning has been restricted to

the context of the learners and some instructors only. Third, it has also been seen that most of the

learners are either students pursuing Diploma or Bachelors' degrees. Hence, there is a limitation

regarding their ability to judge the effectiveness of the online learning process in the domain of

higher education. In the future, the design of the questionnaire could be improved along with the

evaluation of the sample space to include the respondents who have already undergone the

process of online learning within the precincts of higher education. The learning hours and the

effectiveness of the learning process could also be logged for the respondents who volunteer to

be a part of the tracking of the effectiveness of the online learning process.

References

Abrami, P., Bernard, R., Bures, E., Borokhovski, E., & Tamim, R. (2011). Interaction in distance

education and online learning: using Using evidence and theory to improve

practice. *Journal Of of Computing In in Higher Education*, *23*(2-3), 82-103. doi:

10.1007/s12528-011-9043-x

Adjuncts' Working Conditions Affect Student Learning, Report Says. (2018). Retrieved from

https://www.chronicle.com/article/Adjuncts-Working-Conditions/133918

Advantages and Disadvantages of Online Learning | ezTalks. (2018). Retrieved from

https://www.eztalks.com/online-education/advantages-and-disadvantages-of-online-

learning.html

Advantages and Disadvantages of Online Learning. (2018). Retrieved from

http://www.comminit.com/ict-4-development/content/advantages-and-disadvantages-online-

learning

Advantages and Disadvantages of Online Learning. (2018). Retrieved from

http://www.advantages-disadvantages.co/online-learning-advantages-and-disadvantages/)

Agudo-Peregrina, Á., Iglesias-Pradas, S., Conde-González, M., & Hernández-García, Á. (2014).

Can we predict success from log data in VLEs? Classification of interactions for learning

analytics and their relation with performance in VLE-supported F2F and online

learning. *Computers In in Human Behavior*, *31*, 542-550. doi: 10.1016/j.chb.2013.05.031

Al-Alawneh, M. (2013). Examining Ee-learning barriers as perceived by faculty members of

Engineering engineering Colleges colleges in the Jordanian Universitiesuniversities.

International Journal of Vocational and Technical Education, 5(4), 42-53.

Alexander, M., Truell, A., & Zhao, J. (2012). Expected advantages and disadvantages of online

　　　learning: Perceptions from college students who have not taken online courses. *Issues in*

　　　Information Systems, 193-200.

Al-Gahtani, S., Hubona, G., & Wang, J. (2007). Information technology (IT) in Saudi Arabia:

　　　Culture and the acceptance and use of IT. *Information & Management*, *44*(8), 681-691. doi:

　　　10.1016/j.im.2007.09.002

Aljaber, A. (2018). E-learning policy in Saudi Arabia: Challenges and successes. *Research In in*

　　　Comparative And and International Education, *13*(1), 176-194. doi:

　　　10.1177/1745499918764147

Alzeban, A., & Gwilliam, D. (2014). Factors affecting the internal audit effectiveness: A survey

　　　of the Saudi public sector. *Journal oOf International Accounting, Auditing And and*

　　　Taxation, *23*(2), 74-86. doi: 10.1016/j.intaccaudtax.2014.06.001

Analyzing Mixed Methods Data - – Center for Innovation in Research and Teaching. (2018).

　　　Retrieved from

　　　https://cirt.gcu.edu/research/developmentresources/research_ready/mixed_methods/analyzin

　　　g_data

Anshari, M., Almunawar, M., Shahrill, M., Wicaksono, D., & Huda, M. (2017).
　　　Smartphones usage in the classrooms: Learning aid or interference?. *Education*
　　　And Information Technologies, *22*(6), 3063-3079. doi: 10.1007/s10639-017-9572-
　　　7

Arafeh, A. (2018). Online Learninglearning: Bridging the Cultural cultural

　　　Ggaps. *Elearn*, *2018*(3), 1. doi: 10.1145/3192702.3185178

Bakia, M., Shear, Linda, & Toyama, Y. (2012). *Understanding the Implications implications of Online online Learning learning for Educational educational Productivityproductivity.* Washington, D.C: U.S. Department of Education.

Bledsoe, T. (2013). A Multimediamultimedia-Rich rich Platform platform to Enhance enhance Student student Engagement engagement and Learning learning in an Online online Environmentenvironment. *Online Learning*, *17*(4). doi: 10.24059/olj.v17i4.398

Bolliger, D., & Martin, F. (2018). Instructor and student perceptions of online student engagement strategies. *Distance Education*, *97*, 1-16. doi: 10.1080/01587919.2018.1520041

Booth, S. (1997). On Phenomenographyphenomenography, Learning learning and Teachingteaching. *Higher Education Research & Development*, *16*(2), 135-158. doi: 10.1080/0729436970160203

Bora, U., & Ahmed, M. (2013). E-Learning learning using cCloud Computingcomputing. *International Journal Of Science And Modern Engineering (IJISME)*, *I1*(2).

Boria, R., Olson, L., Goodman, S., & Anderson, R. (2014). Spatial filtering to reduce sampling bias can improve the performance of ecological niche models. *Ecological Modelling*, *275*, 73-77. doi: 10.1016/j.ecolmodel.2013.12.012

Bowers, J., & Kumar, P. (2015). Students' Perceptions perceptions of Teaching teaching and Social social Presencepresence. *International Journal Of of Web-Based Learning And and Teaching Technologies*, *10*(1), 27-44. doi: 10.4018/ijwltt.2015010103

Bryceson, K. (2015). The online learning environment— – A a new model using social

constructivism and the concept of 'Ba' as a theoretical framework. *Learning Environments Research*, *10*(3), 189-206. doi: 10.1007/s10984-007-9028-x

Chen, Z., Fang, Z., Fan, W., Edwards, A., & Zhang, K. (2017). CSTG: An Effective effective

Framework framework for Costcost-sensitive Sparse sparse Online online

Learninglearning. *Proceedings Of of The the 2017 SIAM International Conference On on Data Mining*, *23*, 759-767. doi: 10.1137/1.9781611974973.85

Cole, M., Shelley, D., & Swartz, L. (2014). Online instruction, e-learning, and student

satisfaction: A three- year study. *The International Review Of of Research In in Open And and Distributed Learning*, *15*(6). doi: 10.19173/irrodl.v15i6.1748

Creswell, J., W. (2014). *Research designdesign: Qualitative, quantitativequantitative, and mixed mixed methods methods approachesapproaches*. (4th ed.). Thousand Oak, CA: Sage

Publication.

Data Analysis & Statistics. (2018). Retrieved from https://www.edx.org/course/subject/data-analysis-statistics

Davis, K., & Singh, S. (2015). Digital badges in afterschool learning: Documenting the

perspectives and experiences of students and educators. *Computers & Education*, *88*, 72-83. doi: 10.1016/j.compedu.2015.04.011

Deming, D., Goldin, C., Katz, L., & Yuchtman, N. (2015). Can Online online Learning learning

Bend bend the Higher higher Education education Cost cost Curvecurve?. *American Economic Review*, *105*(5), 496-501. doi: 10.1257/aer.p20151024

Denzinger, J., & Kordt, M. (2016). Evolutionary online learning of cooperative behavior with situation-action pairs. *Proceedings Fourth International Conference On on Multiagent Systems*, *12*. doi: 10.1109/icmas.2000.858441

Derong Liu, Ding Wang, & Hongliang Li. (2014). Decentralized Stabilization stabilization for a Cclass of Continuouscontinuous-Time time Nonlinear nonlinear Interconnected interconnected Systems systems Using using Online online Learning learning Optimal optimal Control control Approachapproach. *IEEE Transactions On on Neural Networks And and Learning Systems*, *25*(2), 418-428. doi: 10.1109/tnnls.2013.2280013

Digital natives and digital immigrants — – how are they different. (2018). Retrieved from https://medium.com/digital-reflections/digital-natives-and-digital-immigrants-how-are-they-different-e849b0a8a1d3

Dixson, M. (2015). Measuring Student student Engagement engagement in the Online online Coursecourse: The The Online online Student student Engagement engagement Scale scale (OSE). *Online Learning*, *19*(4). doi: 10.24059/olj.v19i4.561

Doo, M. (2006). A problem in online interpersonal skills training: do Do learners practice skills?. *Open Learning: The Journal Of of Open, Distance And and E-Learning*, *21*(3), 263-272. doi: 10.1080/02680510600953252

Dougiamas, M. & Taylor, P. (2003). Moodle: Using lLearning Communities communities to Create create an Open open Source source Course course Management management Systemsystem. In D. Lassner & C. McNaught (Eds.), Proceedings of EdMedia + Innovate Learning 2003 (pp. 171-178). Waynesville, NC: Association for the Advancement of Computing in Education (AACE).

Dumford, A., & Miller, A. (2018). Online learning in higher education: exploring Exploring
      advantages and disadvantages for engagement. *Journal Of of Computing In in Higher*
      Education, *30*(3), 452-465. doi: 10.1007/s12528-018-9179-z

Dziuban, C., Moskal, P., Thompson, J., Kramer, L., DeCantis, G., & Hermsdorfer, A. (2015).
      Student Satisfaction satisfaction with Online online Learninglearning: Is it a Psychological
      psychological Contractcontract?. *Online Learning*, *19*(2). doi: 10.24059/olj.v19i2.496

Ebert, J., Huibers, L., Christensen, B., & Christensen, M. (2018). Paper- or Webweb-Based
      based Questionnaire questionnaire Invitations invitations as a Method method for Data data
      Collectioncollection: Cross-Sectional sectional Comparative comparative Study study of
      Differences differences in Response response Raterate, Completeness completeness of
      Datadata, and Financial financial Costcost. *Journal Of of Medical Internet Research*, *20*(1),
      e24. doi: 10.2196/jmir.8353

Feldstein, M., & Neal, L. (2006). Designing usable, self-paced e-learning
      courses. *Elearn*, *2006*(8), 1. doi: 10.1145/1165342.1165344

Gashan, A., & Alshumaimeri, Y. (2015). Teachers' Attitudes toward Using Interactive
      Whiteboards in English Language Classrooms. *International Education*
      Studies, *8*(12), 176. doi: 10.5539/ies.v8n12p176

Global self-paced e-learning industry revenue 2021 | Statistic. (2018). Retrieved from
      https://www.statista.com/statistics/684343/global-self-paced-e-learning-industry-revenue/

Günüç, S., & Kuzu, A. (2014). Factors Influencing influencing Student student Engagement
      engagement and the rRole of Technology technology in Student student Engagement
      engagement in Higher higher Educationeducation: Campus-Classclass-Technology

technology Theorytheory. *Turkish Online Journal Of of Qualitative Inquiry*, *5*(4). doi:

    10.17569/tojqi.44261

Gupta, U., Babu, M., Ayoub, R., Kishinevsky, M., Paterna, F., Gumussoy, S., & Ogras, U.

    (2018). An Online online Learning learning Methodology methodology for Performance

    performance Modeling modeling of Graphics graphics pProcessors. *IEEE Transactions On*

    on Computers, *2*, 1-1. doi: 10.1109/tc.2018.2840710

Halpin, P., von Davier, A., Hao, J., & Liu, L. (2017). Measuring Student student Engagement

    engagement During during Collaborationcollaboration. *Journal Of of Educational*

    Measurement, *54*(1), 70-84. doi: 10.1111/jedm.12133

Hamari, J., Shernoff, D., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016).

    Challenging games help students learn: An empirical study on engagement, flow and

    immersion in game-based learning. *Computers In in Human Behavior*, *54*, 170-179. doi:

    10.1016/j.chb.2015.07.045

Hamid, S., Waycott, J., Kurnia, S., & Chang, S. (2015). Understanding students' perceptions of

    the benefits of online social networking use for teaching and learning. *The Internet And and*

    Higher Education, *26*, 1-9. doi: 10.1016/j.iheduc.2015.02.004

Haythornthwaite, C., Andrews, R., Kazmer, M., Bruce, B., Montague, R., & Preston, C. (2007).

    Theories and models of and for online learning. *First Monday*, *12*(8). doi:

    10.5210/fm.v12i8.1976

Hiltz, S., & Turoff, M. (2005). Education goes digital. *Communications Of of tThe ACM*, *48*(10),

    59. doi: 10.1145/1089107.1089139

Hoffmann, C., & Lutz, C. (2014). The impact of online media on stakeholder engagement and

    the governance of corporations. *Journal Of of Public Affairs*, *15*(2), 163-174. doi:

    10.1002/pa.1535

Hoffmann, C., & Lutz, C. (2014). The impact of online media on stakeholder engagement and

    the governance of corporations. *Journal Of of Public Affairs*, *15*(2), 163-174. doi:

    10.1002/pa.1535

Hyman, J., Moser, M., & Segala, L. (2014). Electronic reading and digital library technologies:

    understanding Understanding learner expectation and usage intent for mobile

    learning. *Educational Technology Research And and Development*, *62*(1), 35-52. doi:

    10.1007/s11423-013-9330-5

Internet Access and Education: Key considerations for policy makers | Internet Society. (2018).

    Retrieved from https://www.internetsociety.org/resources/doc/2017/internet-access-and-

    education/

Ippakayala, V., & El-Ocla, H. (2017). OLMS: Online Learning learning Management

    management System system for Ee-Learninglearning. *World Journal On on Educational*

    Technology: Current Issues, *6*(3), 130. doi: 10.18844/wjet.v6i3.1973

Jaggars, S., & Xu, D. (2016). How do online course design features influence student

    performance?. *Computers & Education*, *95*, 270-284. doi: 10.1016/j.compedu.2016.01.014

Janmaat, G., McCowan, T., & Rao, N. (2016). Different stakeholders in education. *Compare: A*

    Journal Of of Comparative And and International Education, *46*(2), 169-171. doi:

    10.1080/03057925.2016.1134956

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed

methods research. *Journal of Mixed Methods Research, 1*(2), 112-133.

Kasabov, N. (2001). Evolving fuzzy neural networks for supervised/unsupervised online

knowledge-based learning. *IEEE Transactions On on Systems, Man And and Cybernetics,

Part B (Cybernetics)*, *31*(6), 902-918. doi: 10.1109/3477.969494

Kauffman, H. (2015). A review of predictive factors of student success in and satisfaction with

online learning. *Research In in Learning Technology*, *23*. doi: 10.3402/rlt.v23.26507

Key facts | Universities New Zealand - Te Pōkai Tara. (2019). Retrieved from

https://www.universitiesnz.ac.nz/about-university-sector/key-facts

King, R. (1976). Bernstein's Sociology sociology of the Schoolschool-- – Some some

pPropositions Testedtested. *The British Journal Of of Sociology*, *27*(4), 430. doi:

10.2307/590183

Kirtman, L. (2009). Online Versus versus Inin-Class class Coursescourses: An Examination

examination of Differences differences in Learning learning Outcomesoutcomes. *Fall*,

104-113.

Kizilcec, R., & Halawa, S. (2015). Attrition and Achievement achievement Gaps gaps in Online

online Learninglearning. *Proceedings Of of The the Second (2015) ACM Conference On on

Learning @ Scale - L@S '15*, *12*. doi: 10.1145/2724660.2724680

Knoblauch, H. (2013). Communicative Constructivism constructivism

and Mediatizationmediatization. *Communication Theory*, *23*(3), 297-315. doi:

10.1111/comt.12018

Kumar, R., Karabenick, S., Warnke, J., Hany, S., & Seay, N. (2018). Culturally Inclusive

inclusive and Responsive responsive Curricular curricular Learning learning Environments

environments (CIRCLEs): An exploratory sequential mixed-methods approach. Retrieved

from https://www.sciencedirect.com/journal/contemporary-educational-psychology

Kuo, Y., Walker, A., Belland, B., Schroder, K., & Kuo, Y. (2018). A case study of integrating

Interwise: Interaction, internet self-efficacy, and satisfaction in synchronous online learning

environments. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1664

Kurlaender, M., Jackson, J., Howell, J., & Grodsky, E. (2014). College course scarcity and time

to degree. *Economics Of of Education Review*, *41*, 24-39. doi:

10.1016/j.econedurev.2014.03.008

Library Guidesguides: Write a lLiterature Reviewreview: Home. (2018). Retrieved from

https://guides.library.ucsc.edu/write-a-literature-review

Limperos, A., Buckner, M., Kaufmann, R., & Frisby, B. (2015). Online teaching and

technological affordances: An experimental investigation into the impact of modality and

clarity on perceived and actual learning. *Computers & Education*, *83*, 1-9. doi:

10.1016/j.compedu.2014.12.015

Liu, I., Chen, M., Sun, Y., Wible, D., & Kuo, C. (2010). Extending the TAM model to explore

the factors that affect Intention intention to Use use an Online online Learning learning

Communitycommunity. *Computers & Education*, *54*(2), 600-610. doi:

10.1016/j.compedu.2009.09.009

Martin, F., & Bolliger, D. (2018). Engagement Mattersmatters: Student Perceptions perceptions

on the Importance importance of Engagement engagement Strategies strategies in the

Online online Learning learning Environmentenvironment. *Online Learning*, *22*(1). doi:

10.24059/olj.v22i1.1092

McCafferty, J. (2014). Positioning for Success success in the Higher higher Education education

Online online Learning learning Environmentenvironment. *Internet Learning*, *12*. doi:

10.18278/il.3.2.2

McCusker, K., & Gunaydin, S. (2014). Research using qualitative, quantitative or
mixed methods and choice based on the research. *Perfusion*, *30*(7), 537-542. doi:
10.1177/0267659114559116

McDaniels, M., Pfund, C., & Barnicle, K. (2016). Creating Dynamic dynamic Learning learning

Communities communities in Synchronous synchronous Online online Coursescourses: One

Approach approach from the Center center for the Integration integration of

Researchresearch, Teaching teaching and Learning learning (CIRTL). *Online

Learning*, *20*(1). doi: 10.24059/olj.v20i1.518

Mehdipour, Y., & Zerehkafi, H. (2013). Mobile Learning learning for Educationeducation:

Benefits and Challengeschallenges. *International Journal of Computational Engineering

Research, 3*(6), 93-101.

Meyer, K. (2014). Student Engagement engagement in oOnline Learninglearning: What Works

works and Whywhy. *ASHE Higher Education Report*, *40*(6), 1-114. doi:

10.1002/aehe.20018

Naidu, D. (2018). A Study study on Smart smart Phone phone Usage usage Pattern pattern − −

Purpose purpose and Preference preference among College college Studentsstudents. *Indian

Journal oOf Commerce & Management Studies*, *IX*(2), 68. doi: 10.18843/ijcms/v9i2/08

New Zealand - – average online hours at home 2015 I Statistic. (2018). Retrieved from

https://www.statista.com/statistics/697792/new-zealand-online-hours-at-home/

Nguyen, T. (2015). The Effectiveness effectiveness of Online online Learninglearning: Beyond

No no Significant significant Difference difference and Future future Horizonshorizons.

Journal of Online Learning and Teaching, 11(2), 309-319.

Odigie, I., & Gbaje, E. (2017). Understanding the perceptions of network gatekeepers on

bandwidth and online video streams in Ahmadu Bello University, Nigeria. *E-Learning And

and Digital Media*, *14*(1-2), 3-19. doi: 10.1177/2042753017692319

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A

scoping review. *The Internet And and Higher Education*, *25*, 85-95. doi:

10.1016/j.iheduc.2015.02.002

O'Leary, C., & Giove, S. (2013). Fostering student engagement. *Student Engagement And and

Experience Journal*, *2*(2). doi: 10.7190/seej.v2i2.81

Oyarzun, B., Stefaniak, J., Bol, L., & Morrison, G. (2017). Effects of learner-to-learner

interactions on social presence, achievement and satisfaction. *Journal Of of Computing In in

Higher Education*, *30*(1), 154-175. doi: 10.1007/s12528-017-9157-x

Palmer, S., & Holt, D. (2009). Examining student satisfaction with wholly online

learning. *Journal Of of Computer Assisted Learning*, *25*(2), 101-113. doi: 10.1111/j.1365-

2729.2008.00294.x

Panhwar, A., Gopang, A., Chachar, Z., & Baloch, S. (2017). Differentiating Cooperative

cooperative Learning learning and Collaborative collaborative Learninglearning: What Is is

Fit fit for Pakistani Higher higher Educationeducation?. *International Journal Of of English Linguistics*, *7*(5), 119. doi: 10.5539/ijel.v7n5p119

Pantic, I. (2014). Online Social social Networking networking and Mental mental Healthhealth. *Cyberpsychology, Behavior, And and Social Networking*, *17*(10), 652-657. doi: 10.1089/cyber.2014.0070

Park, Y., & Bonk, C. (2007). Synchronous Learning learning Experiencesexperiences: Distance and Residential residential Learners' learners' Perspectives perspectives in a Blended blended Graduate graduate Coursecourse. *Journal of Interactive Online Learning, 6*(3), 245-260.

Pedaste, M., Mäeots, M., Siiman, L., de Jong, T., van Riesen, S., & Kamp, E. et al. (2015). Phases of inquiry-based learning: Definitions and the inquiry cycle. *Educational Research Review*, *14*, 47-61. doi: 10.1016/j.edurev.2015.02.003

Peterson, E., Rubie-Davies, C., Osborne, D., & Sibley, C. (2016). Teachers' explicit expectations and implicit prejudiced attitudes to educational achievement: Relations with student achievement and the ethnic achievement gap. *Learning And and Instruction*, *42*, 123-140. doi: 10.1016/j.learninstruc.2016.01.010

Picciano, A., Seaman, J., & Day, S. (2015). Online Learning in Illinois High Schools. *Advances In Early Childhood And K-12 Education*, *12*, 1-18. doi: 10.4018/978-1-4666-6383-1.ch001

Polidoro, F. (2013). The Competitive competitive Implications implications of Certificationscertifications: The Effects effects of Scientific scientific and rRegulatory Certifications certifications on Entries entries into New new tTechnical

Fieldsfields. *Academy Of of Management Journal*, *56*(2), 597-627. doi: 10.5465/amj.2011.0459

Ponto, PhD, APRN, AGCNS-BC, AOCNS®, J. (2015). Understanding and Evaluating evaluating Survey Researchresearch. *Journal Of of tThe Advanced Practitioner iIn Oncology*, *6*(2). doi: 10.6004/jadpro.2015.6.2.9

Porter, W., Graham, C., Bodily, R., & Sandberg, D. (2016). A qualitative analysis of institutional drivers and barriers to blended learning adoption in higher education. *The Internet And and Higher Education*, *28*, 17-27. doi: 10.1016/j.iheduc.2015.08.003

Purkis, H., & Lipp, O. (2010). Stimulus competition in pre/post and online ratings in an evaluative learning design. *Learning And and Motivation*, *41*(2), 84-94. doi: 10.1016/j.lmot.2009.12.001

Rajab, K. (2018). The Effectiveness and Potential of E-Learning in War Zones: An Empirical Comparison of Face-to-Face and Online Education in Saudi Arabia. *IEEE Access*, *6*, 6783-6794. doi: 10.1109/access.2018.2800164

Richardson, J., Maeda, Y., Lv, J., & Caskurlu, S. (2017). Social presence in relation to students' satisfaction and learning in the online environment: A meta-analysis. *Computers In in Human Behavior*, *71*, 402-417. doi: 10.1016/j.chb.2017.02.001

Rosalia, C. (2014). Fostering Selfself-Regulated regulated Learninglearning: Feedback-on-Feedback feedback in a Peer peer Online online Writing writing Centercenter. *Writing & Pedagogy*, *6*(2), 399-429. doi: 10.1558/wap.v6i2.399

Rovai, A. (2000). Online and traditional assessments: what is the difference?. *The Internet And Higher Education*, *3*(3), 141-151. doi: 10.1016/s1096-7516(01)00028-8

Safford, K., & Stinton, J. (2014). Barriers to blended digital distance vocational learning for non-traditional students. *British Journal Of of Educational Technology*, *47*(1), 135-150. doi: 10.1111/bjet.12222

Shea, P., & Bidjerano, T. (2014). Does online learning impede degree completion? A national study of community college students. *Computers & Education*, *75*, 103-111. doi: 10.1016/j.compedu.2014.02.009

Simpson, V., & Richards, E. (2015). Flipping the classroom to teach population health: Increasing the relevance. *Nurse Education In in Practice*, *15*(3), 162-167. doi: 10.1016/j.nepr.2014.12.001

Social Research Methods - – Knowledge Base - – Survey Research. (2018). Retrieved from https://socialresearchmethods.net/kb/survey.php

Squire, K. (2018). Innovation in times of uncertainty. *On The Horizon*, *26*(1), 23-58. doi: 10.1108/oth-01-2018-0005

Stanley, D., & Zhang, J. (2018). Do Studentstudent-Produced produced Videos videos Enhance enhance Engagement engagement and Learning learning in the Online online Environmentenvironment. *Online Learning*, *22*(2). doi: 10.24059/olj.v22i2.1367

Stott, P. (2014). The perils of a lack of student engagement: Reflections of a "lonely, brave, and rather exposed" online instructor. *British Journal Of Educational Technology*, *47*(1), 51-64. doi: 10.1111/bjet.12215

Sung, Y., Chang, K., & Liu, T. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education*, *94*, 252-275. doi: 10.1016/j.compedu.2015.11.008

Survey results: Reporting via pie charts or bar graphs. (2018). Retrieved from

    https://www.surveygizmo.com/resources/blog/pie-chart-or-bar-graph/

Tempelaar, D., Rienties, B., & Giesbers, B. (2015). In search for the most informative data for

    feedback generation: Learning analytics in a data-rich context. *Computers In in Human*

    Behavior, *47*, 157-167. doi: 10.1016/j.chb.2014.05.038

Thang, S. (2005). Investigating Malaysian distance learners' perceptions of their English

    proficiency courses. *Open Learning: The Journal Of of Open, Distance And and E-*

    Learning, *20*(3), 243-256. doi: 10.1080/02680510500298683

The benefits and drawbacks of online learning. (2018). Retrieved from

    https://www.talentlms.com/elearning/benefits-and-drawbacks-of-online-learning

Thomas, G. & Thorpe, S. J. (2018). Enhancing the facilitation of online groups in higher

    education: A comparative review of the literature on face-to-face and online group-

    facilitation. *Interactive Learning Environments*. 1-10. 10.1080/10494820.2018.1451897

Thorpe, S. J. (2011). Using storytelling in the facilitation of online groups. *Group Facilitation: A*

    Research and Applications Journal, (11), 24-39.

Tu, C.H. (2002). The measurement of social presence in an online learning environment.

    International Journal on E-Learning. 1 (2), pp. 34-45. Norfolk, VA: Association for the

    Advancement of Computing in Education (AACE).

van den Berg, M., Overbeek, A., van der Pal, H., Versluys, A., Bresters, D., & van Leeuwen, F.

    et al. (2011). Using web-based and paper- based questionnaires for collecting data on

fertility issues among female childhood cancer survivors: Differences in response

characteristics. *Journal of Medical Internet Research*, *13*(3), e76. doi: 10.2196/jmir.1707

van Joolingen, W., de Jong, T., Lazonder, A., Savelsbergh, E., & Manlove, S. (2005). Co-

Lablab: research Research and development of an online learning environment for

collaborative scientific discovery learning. *Computers In In Human Behavior*, *21*(4), 671-

688. doi: 10.1016/j.chb.2004.10.039

Waters, J. (2012). Thought-leaders in asynchronous online learning environments. *Online

Learning*, *16*(1). doi: 10.24059/olj.v16i1.219

What are the advantages and disadvantages of online learning? - eLearning Industry. (2018).

Retrieved from https://elearningindustry.com/advantages-and-disadvantages-of-online-

learning)

What is a literature review? (2018). Retrieved from https://www.rlf.org.uk/resources/what-is-a-

literature-review/

What is a Content Management System (CMS)? (2018). Retrieved from

https://www.comentum.com/what-is-cms-content-management-system.html

What is Data Analysis? (2018). Retrieved from https://www.predictiveanalyticstoday.com/data-

analysis/

What is Data Preparation? | Datawatch. (2018). Retrieved from

https://www.datawatch.com/what-is-data-preparation/

What is online learning? (2018). Retrieved from

https://www.ed.ac.uk/studying/postgraduate/degree-guide/online-learning/about

Wihlborg, M., Friberg, E., Rose, K., & Eastham, L. (2018). Facilitating learning through an international virtual collaborative practice: A case study. *Nurse Education Today*, *61*, 3-8. doi: 10.1016/j.nedt.2017.10.007

Wong, L. (2011). A learner-centric view of mobile seamless learning. *British Journal Of of Educational Technology*, *43*(1), E19-E23. doi: 10.1111/j.1467-8535.2011.01245.x

York, C., & Richardson, J. (2012). INTERPERSONAL Interpersonal interactionINTERACTION in IN online ONLINE learningLEARNING: EXPERIENCED Eperienced onlineONLINE instructors'INSTRUCTORS' perceptions PERCEPTIONS ofOF influencing INFLUENCING factorsFACTORS. *Online Learning*, *16*(4). doi: 10.24059/olj.v16i4.229

You, J. (2016). Identifying significant indicators using LMS data to predict course achievement in online learning. *The Internet And and Higher Education*, *29*, 23-30. doi: 10.1016/j.iheduc.2015.11.003

Yu, T., & Richardson, J. (2015). An Exploratory Factor Analysis and Reliability Analysis of the Student Online Learning Readiness (SOLR) Instrument. *Online Learning*, *19*(5). doi: 10.24059/olj.v19i5.593

Yuan, J., & Kim, C. (2014). Guidelines for facilitating the development of learning communities in online courses. *Journal Of of Computer Assisted Learning*, *30*(3), 220-232. doi: 10.1111/jcal.12042

Ippakayala, V., & El-Ocla, H. (2017). OLMS: Online Learning Management System for E-Learning. *World Journal On Educational Technology: Current Issues*, *6*(3), 130. doi: 10.18844/wjet.v6i3.1973

9 Steps steps to Overcome overcome the Biggest biggest Obstacle obstacle to Learninglearning:

Time | Udemy for Business. (2018). Retrieved from https://business.udemy.com/blog/9-

steps-overcome-biggest-obstacle-learning-time/

Annexure A: Survey Questions
Section One: Respondents profile

1. Gender

    Male   (   )   Female   (   )

2. Age

    Below 18 years   (   )   19-24 years   (   )

    25-29 years   (   )   30-39 years   (   )

    40-49 years   (   )   50 years and above   (   )

3. Are you an International Student?

    Yes   (   )   No (   )   if yes, your country name …………………………

4. What course are you currently studying?

    Certificate   ( ) Diploma ( )   Bachelor ( )   Master ( )   PHD ( )   Other ( )

    Please specify the name of the course………………………………………...

5. Current year of tertiary study

    1st (   ) 2nd (   )

| 3rd | ( ) | 4th | ( ) |

3rd   ( )   4th   ( )

5th   ( )   6th   ( )

More…   ( )   Not currently studying ( )

Section Two: Online education in universities

6. Have you taken any online learning courses?

   Yes ( )   No ( ) If yes, what course did you take? ....

7. What do you think are the advantages of Online Education**?**

   …………………………………………………………………………………………

   …………………………………………………………………………………………

   …………………………………………………………………………………………

   ………………………………………………………………………………

   What do you think are the disadvantages of Online Education**?**

   …………………………………………………………………………………………

   …………………………………………………………………………………………

   …………………………………………………………………………………………

   ………………………………………………………………………………

8. On a scale of 1-10 how superior do you perceive online learning to be over conventional

   classroom-based learning? And why do you give that rating?

   Inferior   Superior

1 2 3 4 5 6 7 8 9 10

Comment……………………………………………………………..

9. Do you think it is realistically possible to earn an online degree in an applied course such

   as engineering and nursing?

   Yes   ( )

   No   ( )

   Comment…………………………………………………………..

10. Do you believe most employers will recognize and value online degrees as much as ones

   taken in a conventional classroom-based learning environment?

   Yes   ( )

   No   ( )

   Comment………………………………………………………….

11. Do you think online education is more prone to cheating than conventional classroom-

   based learning?

   Yes   ( )

   No   ( )

   Please provide your reasons for your

   choice: ……………………………………………………………………………

   …………………………………………………………………………..

12. How do you tell if online education is fit for aspiring students?

   …………………………………………………………………………………………

   …………………………………………………………………..

13. How do you assess the credibility of an online course?

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………

14. Are there perceived differences in support services provided by online learning in

comparison to conventional classroom-based learning?

Yes   ( )

No   ( )

(Specify)……………………………………………………………………………………

…………………………………………………………………………………...

15. What technological requirements are required to participate in online education?

……………………………………………………………………………………………

………………………………………………………………………………………

Section Three: Students perceptions on long term feasibility of online education

Please rate how strongly you agree or disagree with the following statements:

16. Online education will be largely embraced across the globe in future

Strongly Agree	Agree	Average	Disagree	Strongly disagree

17. The use of online education positively transforms learning outcomes for students

Strongly Agree	Agree	Average	Disagree	Strongly Disagree

We appreciate so much for your participation

Annexure B: Advantages and Disadvantages highlighted by the respondents

Sl No	Advantages	Disadvantages
1	Ease of finding information Easy mode of communication for the students who do not have English as their first language Develops the skills of searching for information efficiently	Could be prone to plagiarism Might inculcate laziness in the students

2	Resource Saving Easy to take up the courses No limit in distance It is also possible for the learners with disabilities to undergo the learning process	Lack of educational quality Hard to evaluate Less communication
3	Resource Saving Easy to take up the courses No limit in distance It is also possible for the learners with disabilities to undergo the learning process	Lack of educational quality Hard to evaluate Less communication
4	Resource Saving Easy to take up the courses No limit in distance It is also possible for the learners with disabilities to undergo the learning process	Lack of educational quality Hard to evaluate Less communication
5	Resource Saving Easy to take up the courses No limit in distance It is also possible for the learners with disabilities to undergo the learning process	Lack of educational quality Hard to evaluate Less communication

6	The amount of time required for the learning process can be decided upon by the learner Ability to manage the time based on the suitability The learners can take up additional activities like work at the same time Easy to communicate for the shy students	Not as effective as conventional mode of learning Learner is not as active as in conventional mode of learning There is a possibility of cheating and malpractice
7	The learners can take up additional activities like work at the same time	Technological issues in executing the process of online learning
8	This mode of learning can be undertaken on an anytime, anywhere basis	Not as effective as conventional mode of learning Learner is not as active as in conventional mode of learning There is a possibility of cheating and malpractice
9	Ability to manage the time based on the suitability The learners can take up additional activities like work at the same time Easy to communicate for the shy students	Opportunity to cheat during the process Lack of opportunity for any inter-personal relationship building Limited resources are available for the process of online learning

10	Increased levels of accessibility	Reduced Interaction Need for support Requires an increase in access
11	Ease of finding information Easy mode of communication for the students who do not have English as their first language Develops the skills of searching for information efficiently	Could be prone to plagiarism Might inculcate laziness in the students

Annexure C: Survey Results

Survey Report

E-Learning

Each of the questions of the survey have been represented in the form of bar charts. These bar charts are indicative of the weightage of the selected responses. It also assists in the comparison of the value as compared with the other worlds ("Survey Results: Reporting via Pie Charts or Bar Graphs", 2018).
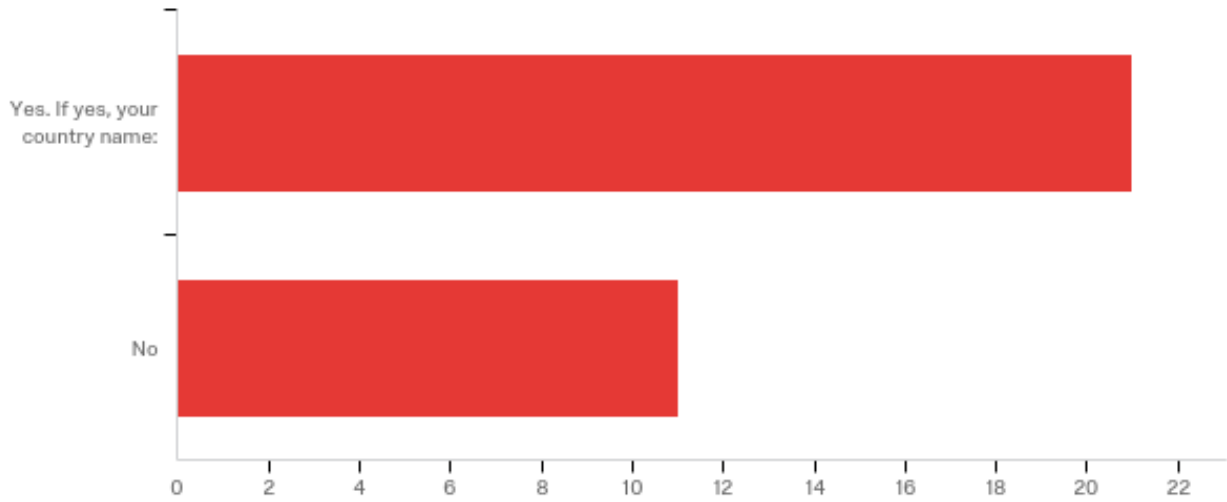
Q2 - 1- Gender:
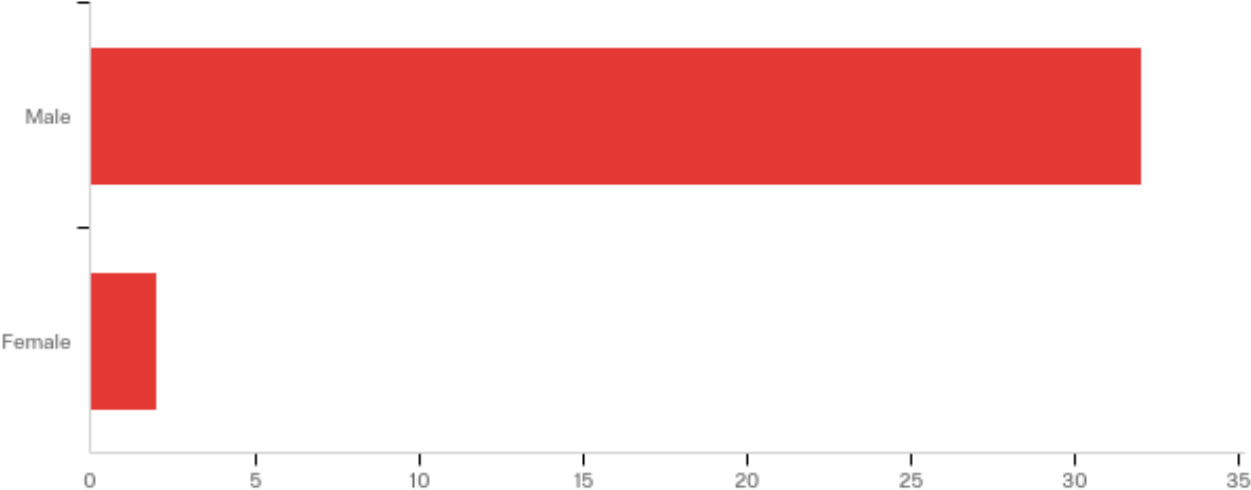
#	Answer	%	Count
1	Male	94.12%	32
2	Female	5.88%	2
	Total	100%	34

Q3 - 2- Age:
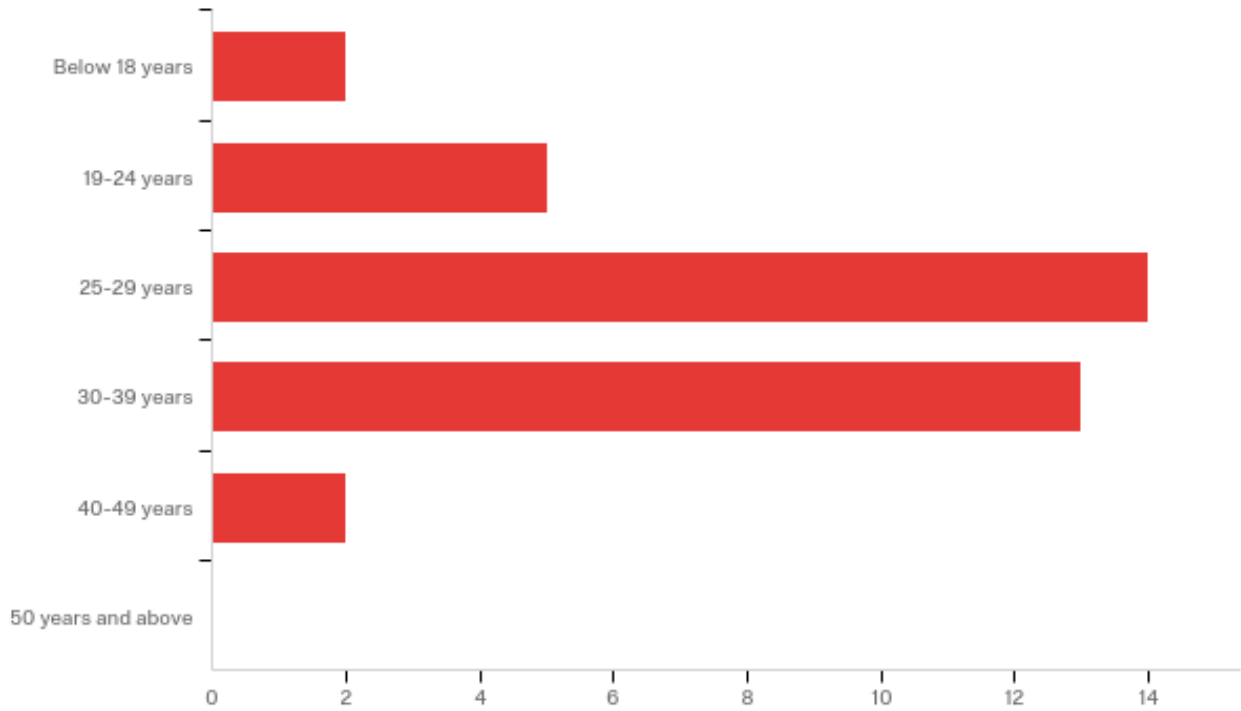
#	Answer	%	Count
1	Below 18 years	5.56%	2
2	19-24 years	13.89%	5
3	25-29 years	38.89%	14
4	30-39 years	36.11%	13
5	40-49 years	5.56%	2
6	50 years and above	0.00%	0
	Total	100%	36

Q4 - 3- Are you an International Student?

#	Answer	%	Count
3	Yes. If yes, your country name:	65.63%	21
4	No	34.38%	11
	Total	100%	32

Yes. If yes, your country name:

Sl No	Country Name	Count
1	Cambodia	1
2	China	1
3	Saudi Arabia	14

| 4 | Kuwait | 2 |
| 5 | United Arab Emirates | 1 |

Q5 - 4- What course are you currently studying?
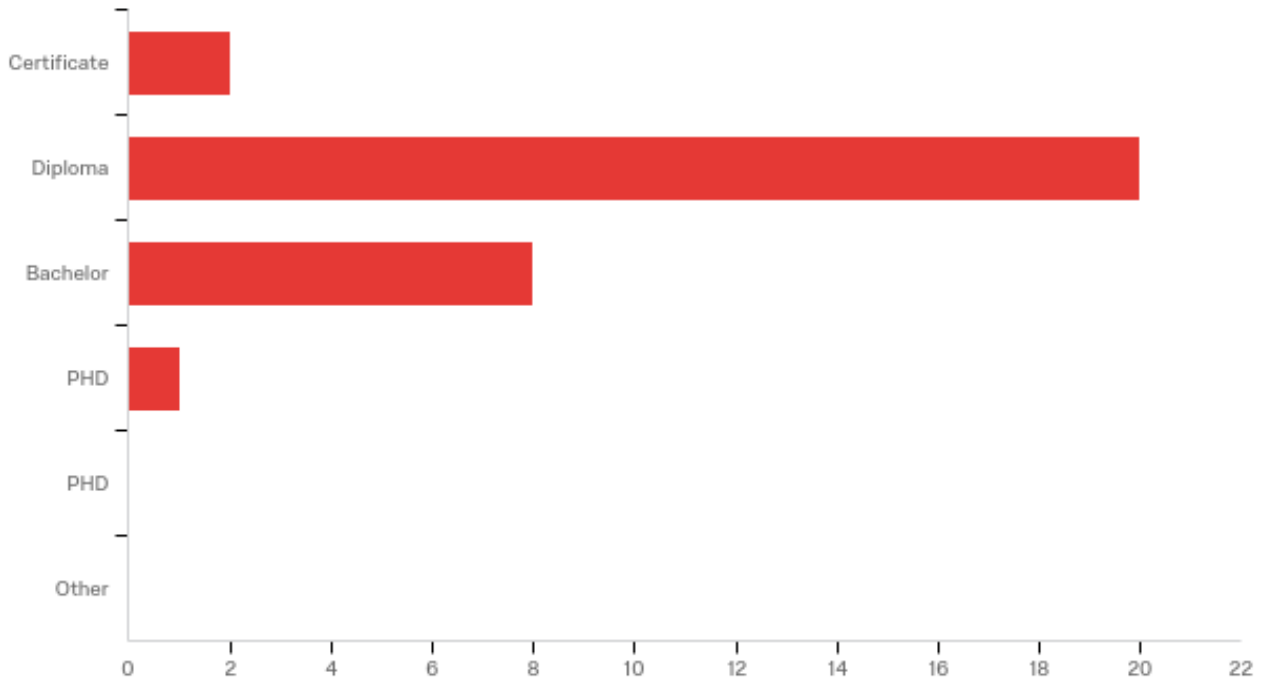
#	Answer	%	Count
1	Certificate	6.45%	2
2	Diploma	64.52%	20
3	Bachelor	25.81%	8
4	PHD	3.23%	1
5	PHD	0.00%	0
6	Other	0.00%	0
	Total	100%	31

Q28 - Please specify the name of the course?

Please specify the name of the course?

MISDF

Bachelor of commerce and property

IT

Mechanical Engineering (Hons)

Business management

Medical Laboratory

Mechanical Engineering

Master of IT

Computer Science

Master of Computer Graphic Design

NZ Diploma in business

Electrical and Electronic Engineering

Engineering

Network and Communication Engineering

Mechanical Engineering

Health Science

Occupational Medicine
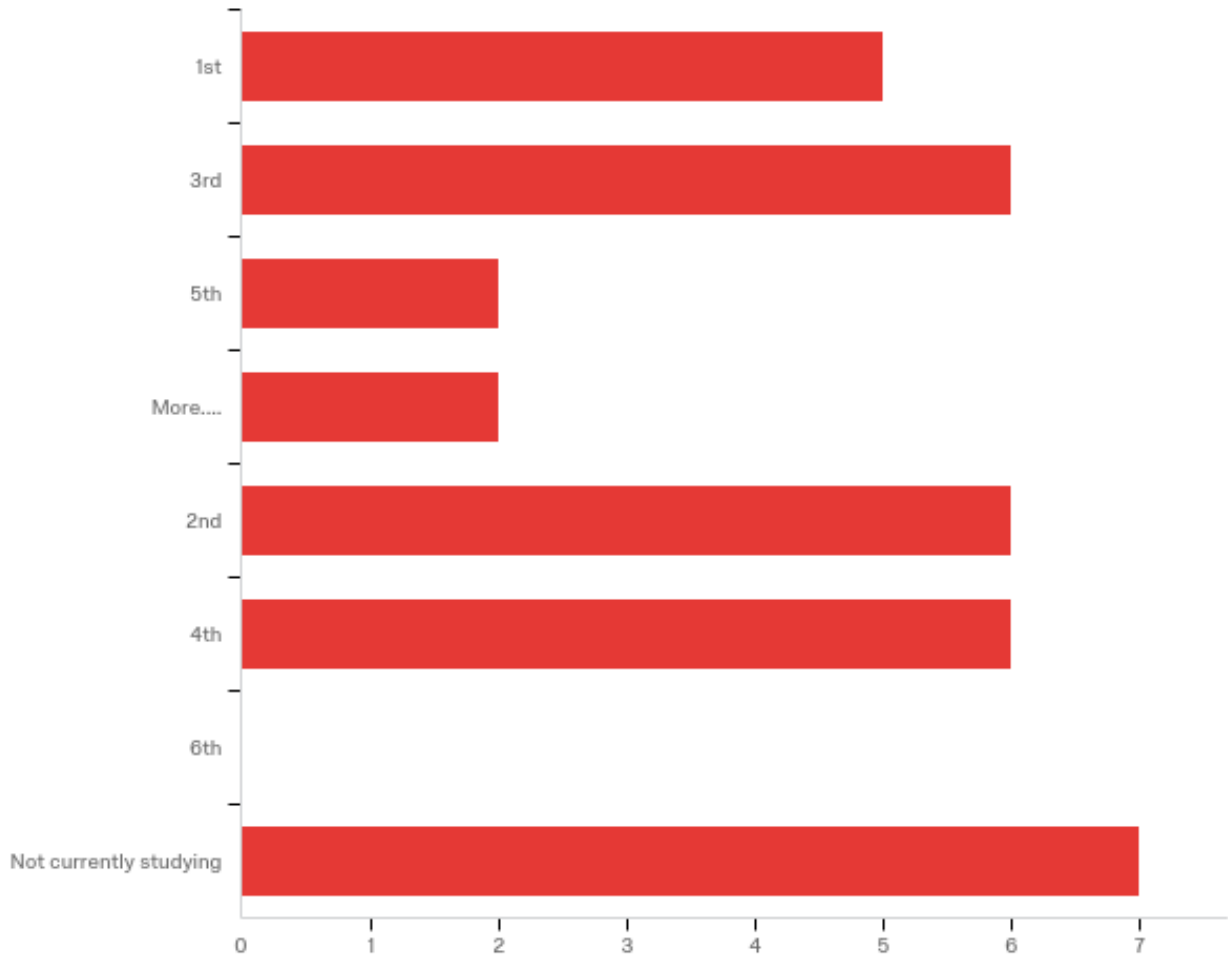
Engineering

Information Technology

Engineering

Electrical Engineer

Management

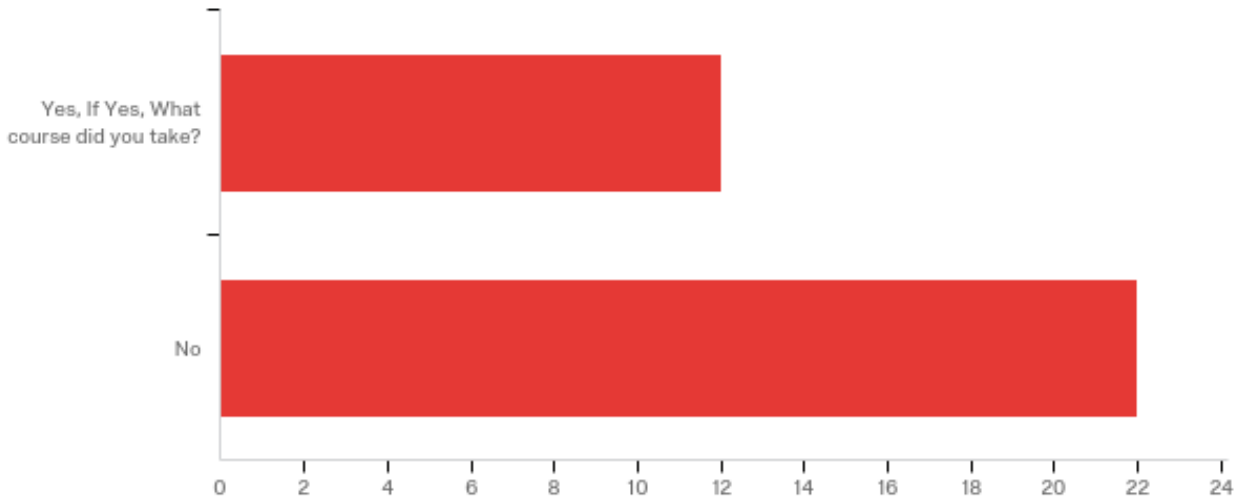Management Accounting

Q6 - 5- Current year of study?

#	Answer	%	Count
1	1st	14.71%	5
2	3rd	17.65%	6
3	5th	5.88%	2
4	More....	5.88%	2
5	2nd	17.65%	6

6	4th	17.65%	6
7	6th	0.00%	0
8	Not currently studying	20.59%	7
	Total	100%	34

Q7 - 6- Have you done any online learning course?

#	Answer	%	Count
1	Yes, If Yes, What course did you take?	35.29%	12
2	No	64.71%	22
	Total	100%	34

Yes, If Yes, What course did you take?

Yes, If Yes, What course did you take? – Text
Computer Security
Pluralsight
Diploma of Infection Control

Refrigeration system

Research

Design courses

NZ history

Frist year of degree, fundamentals course

A research paper

Advanced Auditing

Designed, developed and led an Online Facilitation Skills Programme for group facilitators over 5 years. Also have taken 3 courses through Udacity - Mobile App Development with Xamarin; Python for Data Science and Machine Learning; and Machine Learning - Hands on Python & R in Data Science

Q8 - 7- What do you think are the advantages of Online Education?

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Fast learning but without time pressure to its completion, I can resume studying anytime.

Geographic limitations are not an issue. Freedom to study at your own leisure.

Convenience, ability to study and work, access to better education if not physically close to the Uni.

You can study anywhere and at any time.

There are so many advantages but of the top of my head you can be free for other jobs

- Save time - Help the person who cannot go to College - not costly

Letting international students asking questions without being ashamed of how they sound like

Easy access any time.

Adv: 1-Student can watch the lesson more than once. 2-student can pause the video and write notes 3-youg single mothers who have responsibilities can encourage them to continue their learning.

Invest time Reduce crowded in uni camps

You can learn where ever you are and sometimes whenever you want

Get the job fast I can do the online course while I am in my job

1- time saving (travel from and to the campus takes time especially for those who work in a city and study at another city) 2- cost is less for students and providers . (no public transport or petrol consumption - less university utilities for example chairs, lecture theatre) 3- more comfort for students because studying from home is more comfortable than going at any other place especially if there is a personal office for the student at home. 4- some educational services is better than attending classes for example watching lectures' video can be once or twice or more however the classic lecture is hard to be repeated.

Not really work for me

I haven't done I don't know

Education for All. Save time and money. Preserving the environment.

Online courses give students the opportunity to plan their study time around the rest of their day, instead of the other way around.

Very convenient and I liked it.

Time flexibility

Give me more time to study away of university lecture class as well as that will help me to work as I'm studying

Saving time, easy, you can do another job while u studying, cheaper, being where you like to be. Take the information faster, plenty of resources.

-Could do it from distance -could do it any time of the day as I was working full time.

Easy learning and global studies

Flexibility, easier to attend, time saving, easier to review, tutor must stick with the course topic and work hard to improve quality of course presentation.

You can learn whatever you want , save time and money ,

Flexibility

Time convenience

Advantages: I can study at my own pace and on my own schedule around when I'm available - usually over breakfast. I like that I don't need to travel to classes. The courses are hands on and practical with lots of exercises rather than highly theoretical so I think they quite suit online learning. There's a discussion forum where I can go and ask questions or find the answers to my problems or questions. The videos are good quality, short in duration - less than 20 min and well-spaced. I can also watch them again and again if I like. They were USD10 to take compared to the ~USD550-600 for a university paper locally. Disadvantages: Sometimes the systems don't always work perfectly on my Galaxy Pad (1080 tablet) or iPhone 7s. The learning isn't time bound so if I don't do it regularly the learning is quickly lost. When teaching my Online Facilitation Skills programme I found it was about 5 times the workload and time commitment to deliver the programme over 12 weeks in comparison to a 1 week face-to-face

programme. People also didn't value the online learning as much as face-to-face, which they take as more superior. There isn't the same peer or group interaction online - in fact there hasn't been any capacity for it in the Udemy courses I've taken. Not a big disadvantage, but perhaps the learning is much lower level in comparison to my university studies that were face-to-face.

I don't know

Q30 - What do you think are the disadvantages of Online Education?

What do you think are the disadvantages of Online Education?

I can't ask questions. I can't find clarification sometimes.

Unable to study with peers and meet with the lecturer. I have found a student gets more insights from a lecturer in person as they can ask questions as hoc.

Lack of teacher interaction, removed from uni community, self-driven so need to self-motivated

It is easy to ignore online content and fall behind.

Not the row kinda of education experience

In practical is difficult   Maybe some of attention we are need

Could be prone to plagiarism

Hard to get all the answers you needed

1- can interact if inquires for the student 2-reduce jobs for teachers 3-can be costly for students

Less social

The low engagement on the course

Dose not get enough information of teaching

1- cause laziness: as the wisdom said no pain no gain so if the student doesn't move toward the university and wait for the lecturer and if he missed some notes it will be difficult for him to understand. Therefore, attending classes is part of fulfilling the inspiration and feeling that the student do an effort which need to have a reaction of better understanding. 2- may cause

health problems such as vision weakness and obesity. 3- it depends on other services for

example: if there is no Wifi the student can not study. Also, this applies to the electricity and

laptop availability and so forth. 4- not always trusted especially in the exams. Because there is

no invigilator where the student is doing the exam. However this can be solved by time

limitation which may cause stress or by assigning a time for exam in anyplace which is return

back to the usual study atmosphere.

You can study anytime

Loss the human factor. The tendency to isolation. Loss the talking.

Learning institutions offering online education realize that they cannot effectively monitor the

day to day activities of their students

In my opinion there's no disadvantage

Understanding

It's not reliable course

Not Doing the study practically, cheating, pick up a wrong information.

-could not get a help any time you want as communication with the supervisor could be hard

sometimes. -it's only available for research papers which have no labs.

Technical issues , hard to ask questions , costly for some students, no real practice, and no lab

experiments which is very important for applied sciences degrees

online courses cannot cope with group   of students that try to join discussions.

University staff (teachers or staff) who do not have sufficient experience in dealing with

international students.

Internet required, limited opportunity to ask questions.

Q9 - 8- How many from 0 -100 do you perceive online learning as more superior to conventional learning?

#	Field	Minimum	Maximum	Mean	Std Deviation	Count
1	8- How many from 0 -100 do you perceive online learning as more superior to conventional learning? A	0.00	91.00	53.46	29.27	35

Q19 - comment....

comment....

To me it's still online learning is more preferable because I'm currently working and I don't want to spend too much time and effort on going to classes. Because I'm working, online courses give me a range of options to look for something that I want to improve on what I'm already doing. However, if it's a new subject or field, I would go to conventional classes because I can ask questions and get clarification better.

Superior in the sense that it enables people working full time the opportunity to study regardless of location and commitments. Classroom based learning is more valuable however.

I've always been physically close to good education and some of my best learning there has been through small class discussion with the lecturer facilitating and challenging our thoughts

Both online learning and conventional learning have strengths and weaknesses, but i think the flexibility of online learning makes it better

I don't think online learning is superior

The scale is from 1-10

Online education can help students practise self-study more often

It saves money and time

It's better for students who work while studying and can fill some of the leisure time.

I have not done any online course

Because I did not learn online.

Online learning it's become same as a class learning especially these days with invention of life.

I think online learning it's much better and easier and u can do your study where ever u r!

Because you can not hear new opinion between students

Classrooms encourage participation and interaction with lectures

As mentioned previously I think the main reason is linked to the disadvantage of not having the opportunity for peer and group learning opportunities. Online also requires a stronger self discipline too.

I think it's More Superior coz the student can study when and where ever he likes to study.

Q10 - 9- Do you think it is realistically possible to earn an online degree in an applied course such as engineering and nursing?
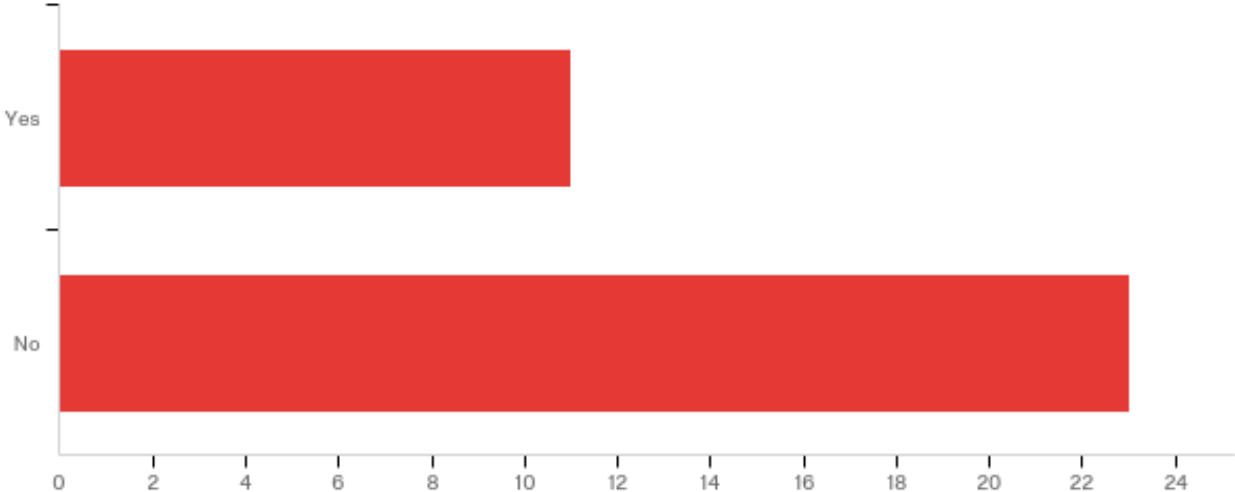
#	Answer	%	Count
1	Yes	32.35%	11
2	No	67.65%	23
	Total	100%	34

Q11 - Comment.....

Comment.....

Provided you can pass all the tests and activities you would be required to do if you were physically in a classroom there is no reason why this isn't possible.

Learning the practical element of the training will be vital

Different kind of learning

May be but also difficult in practical courses

It is possible but the practical skills will be missing

Because some major require interaction with patient for Nurse students

It needs in field education and knowledge of tools

Laboratory can be shown step by step to the student online and then questions will be asked to weigh his understanding.

There's some courses needs to be in class for practice learning such as nursing and engineering..

Could be but hard as the practical part can't be missed in engineering

You have to do practice

Because both of these need a realistic theoretical explanation and practical application

Nursing is a humanitarian profession

These majors have Zero error tolerance.

I want to believe anything can be taught online with the right tools and support. I've also seen classes in the 3D virtual world of Second Life for trainee midwife nurses and they found it

quite positive to have the simulated environment to learn from. AR VR also offers much

promise to the immersive educational experience.

but the need some practices.

Q12 - 10- Do you believe most employers will recognize and value online degrees as much as ones taken in a conventional classroom-based learning environment?
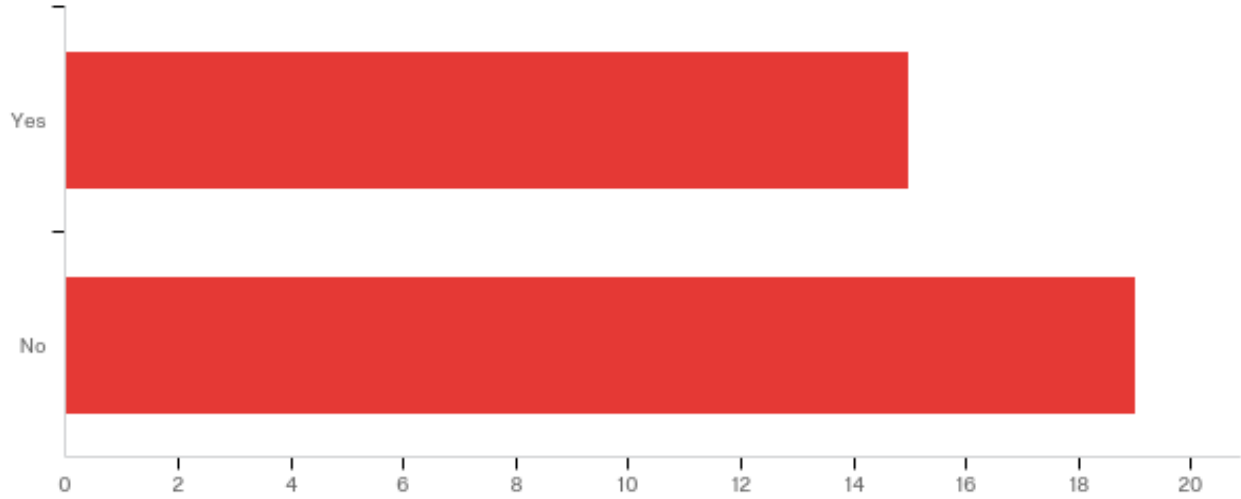
#	Answer	%	Count
1	Yes	44.12%	15
2	No	55.88%	19
	Total	100%	34

Q13 - Comment.....

| Comment..... |
|---|
| Yes if those online degrees are provided by well known organisations or schools. |
| Might not be recognised as being as valuable as classroom based learning but hopefully in time this notion be changes. |
| It's not the same you do not get the classroom experience |
| Not these days. But in the near it is highly likely to happen |
| No they will be suspicious about the knowledge earned in this degree |
| If it's not today it will be in the future. |
| They have to. |
| Because they think that the student did not have the ability to do their jop practically.(no experience) |
| I don't believe they do currently as those recruiting will have had a traditional classroom experience. A generation from now I expect online degrees will be much more acceptable. |
| some of them they think its cheating? |

Q14 - 11- Do you think online education is more prone to cheating than conventional classroom-based learning?
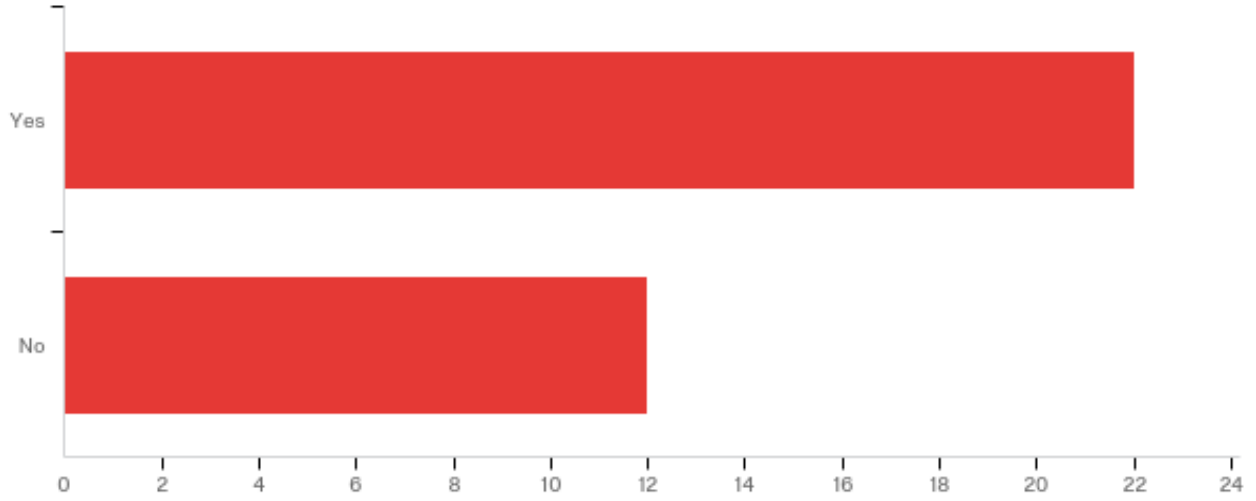
#	Answer	%	Count
1	Yes	64.71%	22
2	No	35.29%	12
	Total	100%	34

Q15 - Please provide reasons for your choice?

Please provide reasons for your choice?
To both options, we still should look at the credibility of the course providers.
Provided content and both papers/tests are changed. Both classroom and online based education are susceptible to cheating.
Might feel less like cheating if you are always on the computer
It is harder for Universities to monitor online assessments
It's obvious no one is watching
Not these days. There are a lot of sites that would detect any plagiarism situations
Cause exams inside the university can be monitored but exam online can not be monitored
Cheating is a bad behavior so if someone want to cheat even conventional class rooms can not stop him. So requesting from student online not to cheat same as conventional classrooms. Also this can be solved by intelligent way which is time duration of exams or tests.
In some courses there's an option for doing an open book exams. So, there's no way of cheating. It' based on knowledge that you have.
The security is low in the online learning when you do testing or exams but there are some solutions.
I haven't seen online exams all I know is that exams will be in normal supervised class rooms
Depends on the individual himself
No supervision

All education is prone to cheating. Online would be no different. I expect due to the

digitisation of everything that it would be somewhat easier to cheat online using sophisticated

and accessible tools.

there are many programs nowadays could stop the cheating.

Q16 - 12- How do you tell if online education is fit for aspiring students?

12- How do you tell if online education is fit for aspiring students?

If the students want it and appear self-motivated then I'd trust that it's best

You can't tell

It is good to learn quickly in any knowledge

Aspiring students are the ones whom study hard. So they wouldn't focus on the disadvantages of online education

Test the outcomes

Well if the student is willing to learn then the way of learning does not matter

If it can help the student achieve a good knowledge about certain field

You can enjoy your day while you're studying.

So that he has another job.

Online education is expanding rapidly, both in scope and level of general acceptance. Many chief educational officers even believe that online education has superior outcomes to traditional coursework. But online education isn't for everyone.

Because it saves time and money.

In certain majors of course as business

Online education is about the student who is interested in studying at anytime and anywhere, so the aspiring students needs this ability more than anyone else.

Making regular interviews with them to test their understanding

No comment

By measuring skills and achievement goals

People who don't have time to attend morning lectures, due to their busy life schedule.

I think if a student has the discipline to study online and is motivated to do so they can pick up the online learning skill sets needed to succeed. The factors that one would see I imagine are the same in conventional classroom-based learning - participation, engagement, doing well in assessments, addressing requirements, adjusting their learning, completing homework and self study components, meeting deadlines.

I don't know

Q20 - 13- How can you assess the credibility of an online course?

13- How can you assess the credibility of an online course?

Look for info of the course providers. Look at whether the website is popular with a lot of users. Look at the feedback from learners and also review the content of the course.

Peers and gauging the value from past students.

The skills of the person who has taken it

I would assess the credibility of an online course by assessing the credibility of the organisation that runs the course

You can't

With credits that come with the program

By online tests that have limited time and students are not allowed to visit other websites

By the results on students and their taken knowledge

Same as conventional courses but with more rules such as time duration. Maybe in the future it can be applied that if the student opened the exam or test website he can not close it and can not jump to other applications.

If the certificate is certified globally or locally.

I'm not specialised to answer this question.

By searching about the course itself and look for other resources

By putting some rolls to secure everything for example placing the tests and the exams.

U can state problems and get the online students to solve in a fixed time. And that could be through Skype to make sure no cheating

Given us byotiful tethered

It's good and trusted for some courses

Through references and ideas put forward

No comment

The reputation of the institution studied with and how well previous students may have performed from the same or similar programmes.

I think the universities can make a contract with each-other all around the world to help in exams cheating.

Q21 - 14- Are there perceived differences in support services provided by online learning in comparison to conventional classroom-based learning?
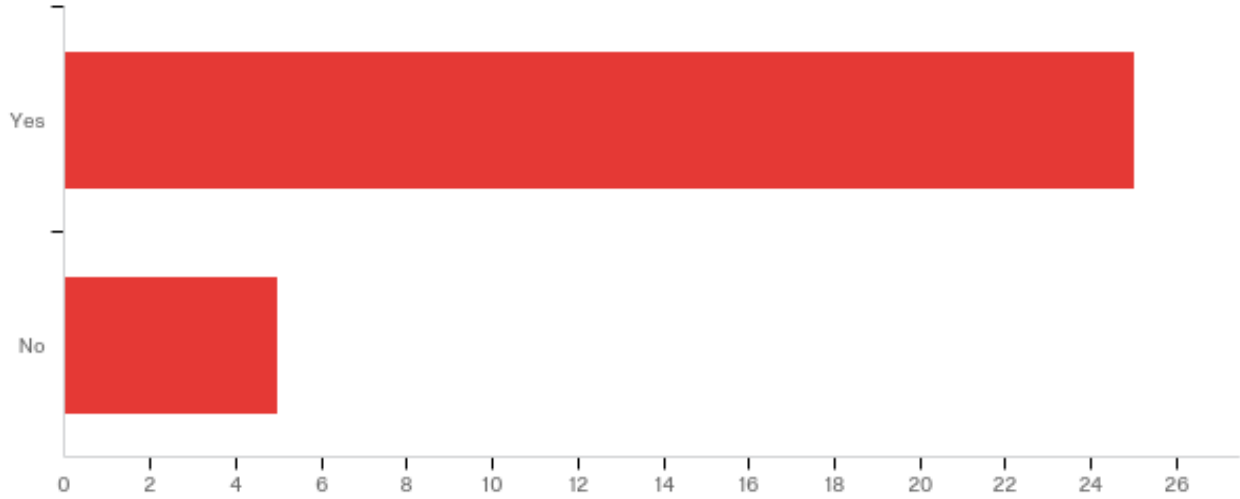
#	Answer	%	Count
1	Yes	83.33%	25
2	No	16.67%	5
	Total	100%	30

Q22 - please specify?

please specify?

Less accessibility to lecturer for discussion - instead email based

Face to face information is more convincing

Online education can detect the attendance of students, but it is not detected in the

conventional classroom education

The interactivity with a class room is much better and more easy

Simply the world that we actually live can be applied in the web world.

Learning responsibility Interaction. The method of education used.

You can go through the lectures again and study through them whenever you want

Being in classrooms and in laps give u more experience and more knowledge.

When doing online course u don't waste time for other students to understand. The time goes

for all for you

Advantages and disadvantages can answer this question

Support online easy and fast

In class activities

My perception is that the majority of support is campus based rather than online. The tutors

and forums are really the only realistic resources available. the phone numbers are often closed

when I want to use them.

Q23 - 15- What technological requirements are required to participate in online education?

15- What technological requirements are required to participate in online education?

Just an up to date Internet browser and fast Internet to view videos.

Good internet connection and laptop/device

Lab top iPad

Internet Computer A quiet place Glass of tea

Online lectures, quizzes to test the students' understanding.

Have an access to the internet

Smart phone Ipad Laptop

Maybe a device that can connect to the internet like a laptop or a desktop and it is preferred to have a headphone with a mic

Main services like electricity and Wifi with addition to computers or laptop or mobile phone.

Computer culture. how to use the Internet.

Videos of tutorials it's ok with some sources provided.

PC

Ability to use internet

Internet Clear video calls Laptop or computer

High speed internet, suitable computers and other needed devices , good online security

Fast connect

Computer and internet connection

Well I've found you need a strong broadband connection and a good graphics card for the

immersive 3D environments. I also needed to download a bunch of software and install it for

other courses. The machine learning courses required me to use my laptop for the exercises,

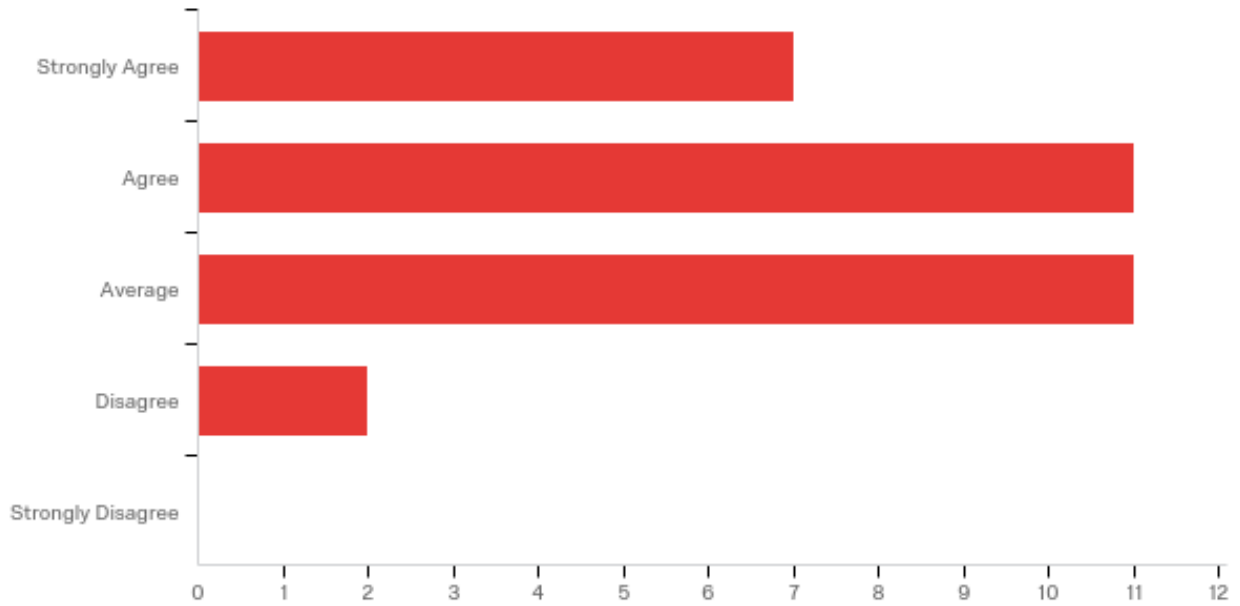however the videos could be seen ok on my tablet and iphone.

Internet.

**Q24 - 16- Online education will be largely embraced across the globe in future**
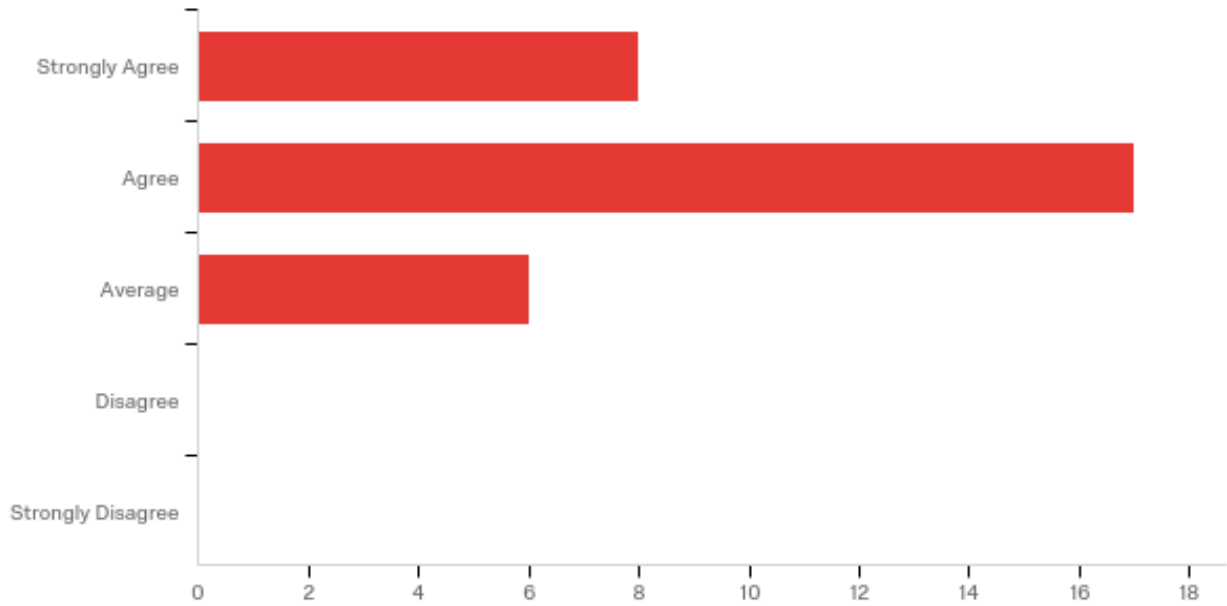
#	Answer	%	Count
0	Strongly Agree	25.81%	8
1	Agree	54.84%	17
2	Average	19.35%	6
3	Disagree	0.00%	0
11	Strongly Disagree	0.00%	0
	Total	100%	31

Q33 - 17- The use of online education positively transforms learning outcomes for students

#	Answer	%	Count
0	Strongly Agree	22.58%	7
1	Agree	35.48%	11
2	Average	35.48%	11
3	Disagree	6.45%	2
11	Strongly Disagree	0.00%	0
	Total	100%	31

Q20 - Topics
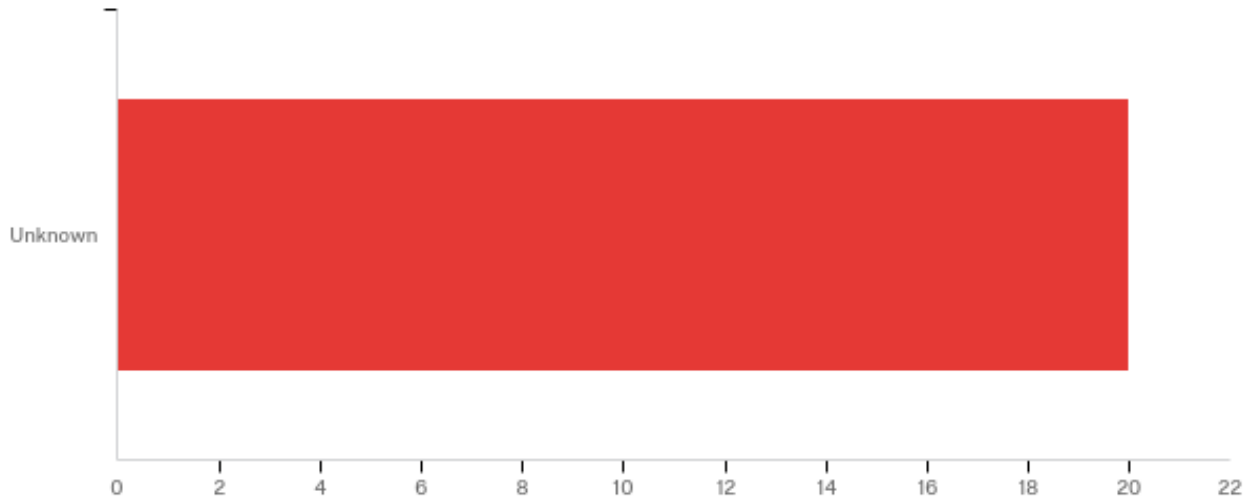
Answer	%	Count
Unknown	100.00%	20
Total	100%	20