

THE IMPACT OF BLENDED LEARNING IN TEACHING AND LEARNING DURING THE COVID-19 SITUATION

تأثير التعلم المدمج في التدريس والتعلم أثناء جائحة كوفيد-19

by

FATHIMA NISANA

**Dissertation submitted in fulfilment
of the requirements for the degree of
MASTER OF EDUCATION**

at

The British University in Dubai

June 2021

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Acknowledgement

Firstly, I would like to thank Allah, the Most merciful to open the door of a Master's education.

Secondly, I would like to thank Dr. Tendai for guiding me and most importantly for his kindness.

He is the best professor I have ever had. He is my professional role model.

I would also like to thank my parents for encouraging and supporting me financially. I am truly grateful to have them in my life. Without them, I would have never reached here. I wish to extend my special thanks to my sister, Amina for supporting me in this journey.

I wish to show appreciation to my dear friend Zainab for her immense support throughout this journey.

Abstract

The purpose of this study was to find out the impact of blended learning in teaching and learning in the light of COVID-19 in a private school in the UAE. The study was carried out to investigate critically, the usefulness of blended learning in the continuation of education and its effectiveness. A mixed-method approach was used for data collection. Data was collected through surveys and interviews. 72 participants took part in the study. Students, teachers, and parents expressed their views on blended learning. To calculate the mean and standard deviation of quantitative data Microsoft Excel was used and thematic analysis was used for qualitative data. The researcher found out that the instructors, learners, and parents had a positive approach to blended learning. The efficacy of blended learning was calculated through factors such as feedback, collaboration, motivation, and assessment. However, participants suggested that proper training should be given in terms of technology adoption.

الملخص

الغرض من هذه الدراسة هو معرفة تأثير التعلم المدمج في التدريس والتعلم في ضوء
في مدرسة خاصة في الإمارات العربية المتحدة. أجريت الدراسة للتحقيق COVID-19
النقدي في فائدة التعلم المدمج في استمرار التعليم وفاعليته، تم استخدام نهج مختلط لجمع
البيانات، تم جمع البيانات من خلال الاستطلاعات والمقابلات، شارك 72 مشاركاً في
الدراسة، عبر الطلاب والمعلمين وأولياء الأمور عن آرائهم حول التعلم المدمج. لحساب
واستخدم Microsoft Excel المتوسط والانحراف المعياري للبيانات الكمية، تم استخدام
التحليل الموضوعي للبيانات النوعية. ووجدت الباحثة أن المعلمين والمتعلمين وأولياء الأمور
لديهم نهج إيجابي في التعلم المدمج. تم حساب فعالية التعلم المدمج من خلال عوامل مثل
التغذية الراجعة والتعاون والتحفيز والتقييم. ومع ذلك ، اقترح المشاركون أنه ينبغي توفير
التدريب المناسب فيما يتعلق بتبني التكنولوجيا

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Chapter 1: Introduction

1.1. Background

Learning is a dynamic and continuous process. It starts with birth and continuous till death. It's both formal and informal. However, with the changing time, the methods and techniques of both teaching and learning keep changing and it is wise to adopt new teaching and learning techniques to compete with the emerging challenges. Blended learning, also termed hybrid learning, is a comparatively new concept that works through the amalgamation of traditional learning methods and modern e-learning.

Similarly, Dziuban et al., (2018) mentioned that the word blended means the amalgamation of diverse mechanisms into a single, but more effective one. Since the learning approaches can be broadly divided into two categories-traditional learning and modern or digital learning. And when these two are combined, it is called blended or hybrid learning. Blended learning is the combination of traditional face-to-face learning with digital or online learning (Hrastinski, 2019).

COVID-19 is a new dangerous viral disease that was first reported in the Chinese city of Wuhan in 2019 and has since spread throughout the world. COVID-19 was proclaimed a pandemic by the World Health Organization (WHO) on March 11, 2020, based on the rate at which it was spreading and destroying human lives around the world. The epidemic has had a significant impact on the educational system around the world, resulting in the near-complete shutdown of schools, colleges, and universities. In an effort to slow the spread of the virus, most governments around the world have chosen to temporarily close educational institutions.

The educational system ever in history has been extremely affected by this pandemic. The already existing education inequalities are being worsened by the pandemic, as it has reduced the

opportunities for the most vulnerable class of society. They're formal and casual, based on technology and people, autonomous and convivial, and directed and discovery-oriented.

As technology has become more readily accessible, blended learning has thus altered the landscape of classrooms over the past few years. Since the future is unpredictable, the community should learn all the available and possible ways of teaching and learning. The current COVID-19 situation justifies this claim. The schools throughout the world has redesigned themselves and the blended learning has become the new common. However, the pandemic has taught to learn and adopt new ways of teaching and learning that were either unknown earlier or were not in practice. Since the research is to discuss the role of blended learning on education during this pandemic, the focus is on both themes proportionately. Amir et al., (2020) conducted an investigative study on medical students to know about their opinion about the educational loss during the COVID-19 situation and they concluded that despite being a great challenge, dental students were able to beat the situation by adapting to the new learning methods, as they were somewhat familiar with digital learning before the COVID-19 situation. The majority of the students believed that in the future, mixed classroom and online learning may be used in such emergency situations. As a result, the COVID-19 epidemic has altered not only the use of technology in education, but also future pedagogy tactics.

Blended learning is a method of instruction that mixes face-to-face and online learning. Blended learning can also be seen as a kind of artifact symbolizing the divide between traditional and digital learning.

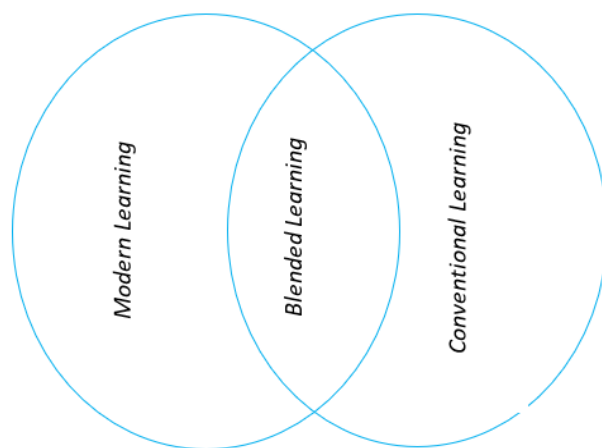


FIGURE 1- 1 : BLENDED LEARNING

In history, no other pandemic, or war, or disaster, or any virus or bacteria has killed more human beings than COVID-19 (Walsh, 2020). Similar to other sectors it has affected the education sector both in positive and negative ways. To curb the spread of the virus all the educational systems are moved from physical to virtual learning systems (Walsh, 2020).

Therefore, the schools throughout the world have redesigned themselves and blended learning has become the new common. The concept of blended learning was introduced to give students the best learning experience with multiple audio-visual examples. But now when the pandemic is at its peak, it is the best approach to enhance social distancing.

1.2. Rationale

The study was carried out to investigate critically, the usefulness of blended learning in the continuation of education and its effectiveness. It was possible to do so probing into other direct and indirect factors, how familiar were the teachers and students with digital learning. Thus, it was a broader investigative study that underpinned the role of blended learning during COVID-19 in the UAE.

This research aims to investigate the strategies that are applied to reduce the adverse effects of the pandemic on education. The sole objective is to critically analyse blended learning and its role in teaching and learning, particularly during COVID-19. The research provides insight into different digital skills and their efficacy. It also provides an analysis of the challenges teachers and students faced, who lacked these digital skills. This study provides a deeper understanding of the opinions of the stakeholders in giving justification to learn different teaching and learning approaches.

Chapter 2: Literature Review

2.1 Introduction

In educational technology, there is an increasing emphasis on a mixed teaching and learning approach that is simply termed the blended approach. It can be said that a mixed or blended method is the amalgamation of the virtual and the physical methods, though it's not the only way to define the term. Different researchers and scholars have defined it in different ways and each definition is correct as the philosophy of this approach is much broader than a mere combination of two or more approaches.

This chapter is organized after a thorough review of the available authentic literature. It is aimed to mention the reviewed literature in a way to understand the essentials of the term blended learning. The purpose is to make it more precise but clearer and interesting.

This concept is becoming rapidly popular and common and its urge is being intensely felt particularly in the current COVID-19 pandemic which has impacted education, besides health and economy, to an unpredictable extent.

2.2. Educational Technology

Technology means the efficient use of scientific knowledge in actual practice. It is thus based on theoretical information emerging from different disciplines including philosophy, education, communication, psychology, sociology, artificial intelligence, computer sciences, and, many more. It also encompasses experimental knowledge achieved through educational training. The major purpose of educational technology is improvement in education. In addition, technology is expected to facilitate learning processes and improve the performance of the educational process.

Over the last years, technology possesses a vital role in education so it is necessary to understand the concept, its applications, possible challenges, and drawbacks too. Like its vast applications, educational technology has been defined differently by many researchers and writers. A review by Januszewski and Molenda (2008) defined educational technology is defined as the research and ethical practice of helping learning and purification through the creation, consumption, and management of appropriate technological processes and resources. The definition has two parts- the meaning of the term and its objectives.

Educational technology is bringing technology into educational practices to improve quality and performance. It is an orderly interactive process for designing instruction or training meant to improve performance. The theory and practice of designing, developing, deploying, managing, and evaluating procedures and resources for learning is known as instructional technology or educational technology (Seel and Richey, 1994). According to Spector (2015) the disciplined use of knowledge to increase learning, instruction, and/or performance is referred to as educational technology.

Though different scholars have defined the term differently, the crux of the definitions is more or less the same i.e. incorporation of technology in education to get maximum benefits, in the best possible ways. It is the educational technology that provides access to the most remote and inaccessible areas to benefit them, particularly in education to eradicate disparity in the education sector.

2.3. The impact of technology in education

The present era is considered the era of technology. It has been playing its role in making the world more civilized, enhancing artistic skills, and improving living standards by inventions and discoveries. Technology has been incorporated into every field of life to make life easier and raise its standard. Education is one of the major fields of life where technology possesses immense importance. The importance of the internet has become inevitable as it is playing its role in improving education in many folds. Given the numerous disadvantages associated with its use, the technology is a boon to learners. The use of Internet is so widespread and has grown to such proportions that we can't picture life without it. The internet is widespread, from television to gaming consoles to our phones. (Raja and Nagasubramani, 2018).

Technology despite being a wonderful invention has often been debated for many of its drawbacks. But on rational analysis, one comes to realize that it all depends upon its users. If we use it positively, it will benefit us to the maximum, and if we misuse it will bring us towards destruction. Similarly, proper guidance and training are required both for teachers and students for effective use of technology. There are enormous challenges that instructors face due to the rapid advancement of technology, particularly for those who had been using the traditional methods of teaching for a greater part of their lives. The world has dramatically changed with advanced technology. Thus, there is mounting demand that teachers should have adequate knowledge about the use of these technologies to make their teaching purposeful, effective, and up to the modern needs and requirements. It is the attitude of Teachers towards technology for its successful implementation in education. Teachers are often reluctant in using this technology in its various forms for instance their attitude towards the use of computers. Such attitudes towards computers may result in the failure of computer-based projects (Gressard and Loyd, 1986).

In another study Tinio (2002) highlighted that ICT plays its role in education by making it possible for the teachers to make their teaching and learning more productive. There are modern approaches to teaching and learning like - Evaluative learning, Active learning, Collaborative and cooperative learning, Creative Learning or Integrative Learning All these methods of learning are supported and consolidated only through the use of ICT.

Furthermore, Stosic and Lazar (2015) defined educational technology as a methodical and well-organized process of improving the quality of education and making it fruitful for human beings. It is the application of technology for theorizing the execution and evaluation of the educational process in the field of learning and teaching. It encompasses instructional materials, methodologies, and work and relationship organization, as well as the conduct of all educational participants.

In a similar debate, Moore (2012) has given a very logical and interesting justified explanation regarding the introduction and use of new technology in teaching and learning. In this scenario, based on the adoption and use of technology, learners have been divided into five major categories.

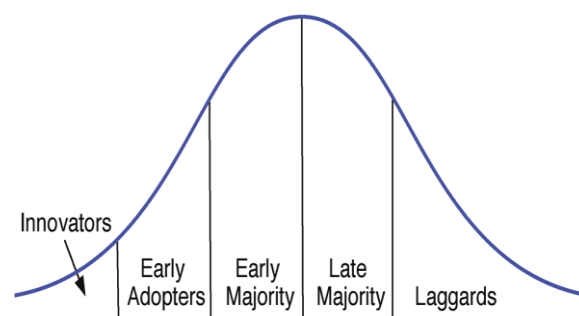


FIGURE 2-1 : TECHNOLOGY ADOPTION CYCLE

The word innovation has been used for new items/products the adoption of that requires a change in our behavior. This fits in the case of the invention and adoption of technology.

The technology adoption cycle by Moore (2002) can be explained thoroughly in the form of a table.

Categories	Characteristics In The Perspective Of Their Attitude Towards Use Of Technology
Innovators	These are the learners who are enthusiastic about technology and accept and adopt it as quickly as they can. They like innovations that's why they are quick adopters.
Early Adopters	These learners are considered as Visionaries who spend most of their time in imagination. Thus, they too like to, understand, appreciate, and adopt technology quickly.
Early Majority	Pragmatists who want to wait and watch how a new technology develops before committing considerable resources.
Late Majority	Conservatives who wait on adopting a new technology until it is broadly accepted, widely used and universally accepted.
Laggards; Skeptics	The learners who are totally reluctant in adopting anything new in their profession for one reason or the other.

TABLE 2-1: TECHNOLOGY ADOPTION CATEGORIES

2.4. Definitions of the term Blended Learning

The word blended learning has been described in a number of ways, but most of them agree on one thing: it refers to a combination of traditional and online education. Graham (2006), for

example, describes the face-to-face settings, which are defined by synchronous and human interaction, and ICT-based settings, which are asynchronous and text-based, and in which humans operate autonomously, are merging. Garrison and Vaughan (2008, p.5) define blended learning as "the thoughtful fusion of face-to-face and online learning experiences," highlighting the importance of reflecting on conventional ways and rethinking learning and teaching in this new environment. Furthermore, Mason and Rennie (2006, p.12) defines blended learning as "other combinations of technologies, locations, or pedagogical approaches".

Littlejohn and Pegler (2007) explained that when the conventional learning approach is mixed with modern approaches, particularly when scientific ways are incorporated into learning, it becomes a blend. This is a valuable method because it shifts the focus in learning design from just addressing the traditional and e-learning to also considering the design difficulties of introducing e-learning and the process of mixing the two.

As Garrison and Kanuka (2004) pointed out, the concept of combining classroom and online settings is simple, but it is also complex, as seen by the wide range of settings, diversity of the student population, and resulting learning designs. In both campus-based and distant programs, several combinations of technology and pedagogy have been described (Stacey and Gerbic, 2006).

The depth to which ICT has been incorporated or integrated into courses also indicates complexity. Littlejohn and Pegler (2007, p.26) prefer to talk about 'strong' and 'weak' blends to illustrate a continuum across considerable to very little quantities of e-learning. However, blended learning, according to Vaughan (2007), is not merely augmenting a face-to-face course with online learning.

In addition, Bullen and Alltree (2006) defined blended learning as educational delivery in which enhanced digital learning experiences and outstanding classroom-based teachings are combined or incorporated in a comprehensive, perceptive, and progressive manner to increase knowledge and adaptability. In the context of professional growth, combining technologies with face-to-face interaction is one way to form a community of practice.

Moreover, Littlejohn and Pegler (2007) also proposed blended e-learning to be a helpful technique since it shifts the direction of instructional strategies by changing the dynamic from merely contemplating the physical and virtual worlds to analyzing the technical problems of e-learning as well as the task of blending, the virtual and physical worlds.

Additionally, Garrison and Kanuka (2004) expressed, the blend of conventional environments and online settings has flexibility, however, there is an ambiguity to the definition that is apparent in the wide range of situations, the variability of individual environments, community, and subsequent learning patterns. Modified versions of technologies and teaching methods have been recorded in both college and distance systems.

Furthermore, blended learning is a flexible model that combines conventional learning strategies with web-based lessons to navigate and support learners as one of the learning stages of each learning process. Innovative approaches focused on the use of curriculum technologies in the creation of modern instructional scenarios. Blended learning is one of the teaching techniques that incorporates a range of tools and experiences throughout teaching experiences that allow learners to connect and create ideas. To conclude, blended learning is a new approach that incorporates learning privileges in both virtual and physical learning processes. It is also moving from instructing to experiencing as well as from teacher to student-centered lessons. This contributes to the growth and advancement of the standard of the teaching process.

Blended learning focuses on maximizing the achievement of learning objectives by utilizing appropriate learning technology to fit the appropriate personal learning style and convey the appropriate skills to the appropriate individual at the appropriate time (Singh and Reed, 2003).

Although there is no universal agreement among higher education institutions on the specific composition of a blended course, most institutions use blended (or equivalent terminology) to refer to a mix of on-campus class meetings and online activities.

Besides, Singh, Harvi and Reed (2005) articulated that the term blended was originally used for combination of traditional classroom training and eLearning activities but in the advanced world, this has gone beyond that. They have presented the following six possible dimensions for the possible application and understanding of the approach:

- I. Offline and online learning
- II. Self-paced, live, and collaborative learning
- III. Structured and unstructured learning
- IV. Custom content with off-the-shelf content
- V. Work and learning
- VI. Ingredients blending synchronous physical formats, synchronous online formats, and self-paced, asynchronous formats.

2.5. Theoretical Framework

There are many models presented by researchers and scholars to make the concept of blended learning comprehensible and make its application easier and effective. For the current study two models are mentioned, that appealed to the researcher most appropriately and covering all the possible perspectives of the concept. The Khans Octagonal Framework is represented as below

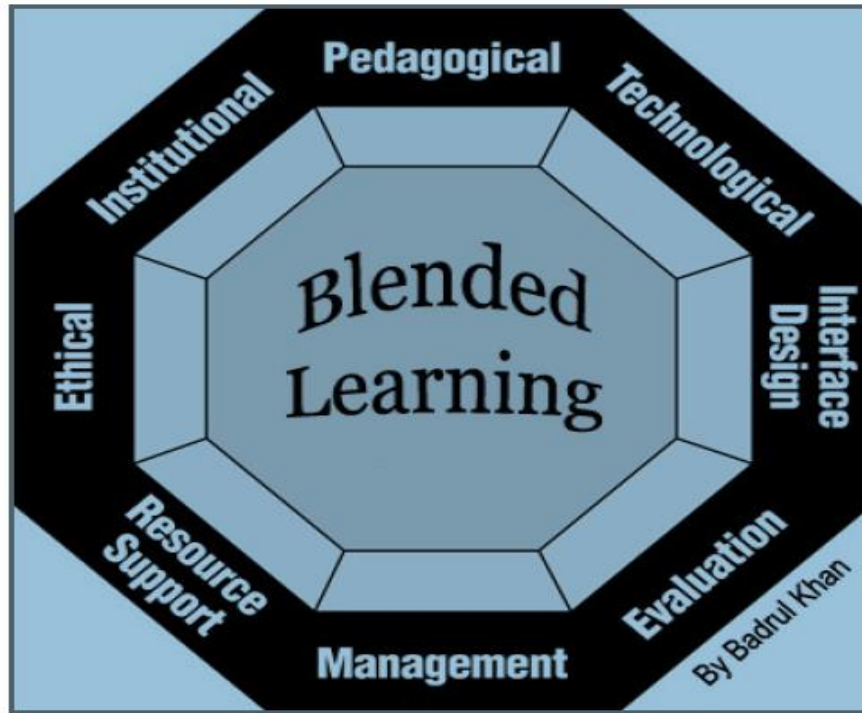


FIGURE 2- 2: KHAN'S OCTAGONAL FRAMEWORK

Institutional, Pedagogical, Technological, Interface Design, Evaluation, Management, Resource Support, and Ethical are the eight dimensions of the framework. All of these characteristics reflect eight distinct and significant challenges that must be addressed.

Each of these dimensions is briefly discussed below:

I. Institutional Dimension

It is concerned with organizational, administrative, academic, and student services issues.

II. Pedagogical

The goal analysis, content analysis, and audience analysis are all covered in this section of the Octagonal framework. It also addresses e-learning strategy and design. It also discusses the various options, including listing all of the learning goals in a program and then selecting the most effective delivery mode.

III. Technological

It justifies the need for a learning management system (LMS) that can handle a variety of distribution methods as well as a learning content management system (LCMS).

IV. Interface Design

The user interface of each element in the blended learning program is addressed in this dimension. The interface must be sophisticated in order to integrate the many aspects of the blend.

V. Evaluation

This section focuses on evaluating the efficacy of a blended learning program. The program should be able to assess the effectiveness of a learning program as well as the performance of each individual student. The proper evaluation approach for each delivery modality should be utilized in a blended learning program.

VI. Management

The Management dimension deals with issues related to the management of a blended learning program, such as infrastructure and logistics to manage multiple delivery types. Issues like registration and notification and scheduling of the different elements of the blend are also dealt with through this dimension.

VII. Resource Support

This section is about creating several resources. A counsellor tutor who is constantly available in person or by any means could be a resource support.

VIII. Ethical

It emphasizes the ethical concerns that must be addressed when creating a blended learning program. Lack of equal opportunity, cultural diversity, and nationality are all challenges that should be addressed.

This methodology can be used to design, develop, manage, deliver, and evaluate the efficacy of blended learning programs. It suggests a careful concentration on possible issues to make the learning effective and maximize the return. It also examines different learning styles, objectives of the material as an evaluation of the learners' learning process.

Another model by Valentine et al. (2021) is specially created for Digital Learning Plan that guides to carry out the teaching and learning process during this current or any future unfavourable situation.

This framework directs professional development and aids educators to plan smoothly carrying out the teaching and learning activities in any situation, as it provides diversified ideas. It provides the guidelines in a mechanized stepwise process.



FIGURE 2- 3: DIGITAL LEARNING MODEL

This plan focusses on personalized, student-centered learning. Curriculum, Instruction, and Assessment; Use of Space and Time; Robust Infrastructure; Data and Privacy; Community Partnerships; Personalized Professional Development; and Budget and Resources are the seven essential components in this research-based system.

2.6. Characteristics of Blended Learning

Blended learning, according to Huang, Zhou, and Wang (2006), has three characteristics. One of those is flexibility in the provision of educational material. Blended learning is regarded as an educational approach that is being established in a digital world. The other one is the development of variability of learning. Since individuals are varied in case of knowledge styles, cognitive capabilities, and mental agility, blended learning will meet the needs by providing a way for personalized learning and self-exploration to happen. The third one is the expansion of distance learning practice. From the educator's point of view, blended learning could indeed help them to develop their previous instructional methods.

According to Al Fiky (2011) blended learning remodels instructional framework with the following attributes:

- Changing from tutorials to student-based learning.
- Integrated assessment methods for educators and learners.
- Expands the environments and tools for learning. (Bourke,2010)
- Promote the availability of activities and resources to learners.
- Increase morale of learners via engagement and cooperation.

In addition, Carman (2005) identified five major blended learning elements that are:

Live Events: Concurrent, educator training sessions with the participation of all participants at the same time. For several students, nothing would substitute the potential to translate on the competence of a live instructor.

Assessment: A gauge of students' learning insight. Pre-assessments may take place before live or self-study happenings to ascertain foreknowledge, and post-assessments may take place after planned or virtual studying occurrences to quantify learner engagement. Assessment is not restricted to traditional tests, homework assignments and evaluations.

Descriptive responses, portfolio assessments and, most pertinently, the developer is nominated to reflect on a blended learning system. The efficacy or utility of both types of evaluation is acceptable. Assessment is among the most important aspects of blended learning.

E-learning: Learning activities that the student completes on his or her own time, at his or her own speed. The blended learning approach benefits greatly from self-paced and distributed learning activities. In attempt to acquire optimum benefit – actual market outcomes – from a self-regulated learning, it should be focused on the successful execution of the training design concepts.

Collaboration: Students are interacting and creating with others. E-mail, collaborative forums, and blogs are also examples of this.

Supporting Material: This provide both tangible and interactive reference resources that help learners in acquisition and conversion. This would include: printer friendly resources, work aids and electronic devices.

2.6. Effectiveness of Blended Learning

While reviewing the relevant literature, Salman (2002) has expressed the importance of blended learning. The study mentioned that online learning is quite a new and comparatively interesting practice, but it has many disadvantages. One of its main disadvantages is that it puts an end to social interaction. This necessitated the need for a special approach. Moreover, Roger (2001) explained new teaching and learning strategy, known as hybrid or blended learning, emerges from the intersection of traditional face-to-face and online learning.

Furthermore, Kenney and Newcomb (2011) researched to determine the efficacy of blended learning in specific grades and found that blended learning resulted in higher average results than non-blended learning approaches. Garrison and Kanuka (2004) investigated the transformative efficacy of blended learning and found that it improved course completion rates, retention, and student satisfaction. There were no significant differences between the groups in terms of academic accomplishment, grade dispersion, or gender performance differences, according to comparisons between blended learning environments (Demirkol and Kazu, 2014).

However, the efficiency of blended learning is influenced by a number of factors. The most important elements are student characteristics, design features, and learning outcomes. Lack of family support is linked to learners' failure to complete their online education, according to studies. Learner dropout is caused in some circumstances by excessive workload (Park and Choi, 2009). Another deciding aspect is the level of interaction between the learner and the teacher, which is especially important in the case of solely online learning. Besides Kintu and Zhu (2016) looked at the impact of student characteristics and background on learner outcomes. The characteristics and background elements, as well as blended learning design, features such as technical quality, learner interactions, and Moodle with its tools and resources, were

investigated. Learner attitudes toward blended learning were major determinants in learner happiness and motivation, while workload management was a significant influence in learner satisfaction and knowledge development, according to the findings of that study. Improved pedagogy, easy access to knowledge, more collaboration among learners, personal presence, cost-efficacy, and easy review of learning content are all advantages of the blended method (Osguthorpe and Graham, 2003). Only learner interaction was a great factor in learner satisfaction and knowledge creation among the blended learning design aspects. Additionally, Kenny and Newcomb (2011) built their assessment taking into account the possibilities and found that mixed education had a more general score than non-mixed education environment. However, the possibilities of combined learning depend on very different variables and there should be appropriate features, plan highlights, and learning outcomes between them. The research suggests that students are frustrated with their progress toward online school education, which is a brief study of student learning (Park and Choi, 2009). In addition, it depends on the cooperation of students with teachers as they are unable to move forward with internet learning. Park and Choi (2009) have shown that overall hierarchical assistance assesses student travel and achievement in online courses, as student responsibility decreases, now showing that students are ready to learn progressive labor while focusing and improve their capabilities.

In another study by Kintu and Zhu (2016), highlighted that student attitude towards learning is a critical component for student contentment and motivation, while responsibility for student fulfillment and administrator information growth is also a big role. The importance of student community in student fulfillment and information development is underlined in mixed learning settings.

In addition, Lim and Morris (2009) investigated the impact of student and educational factors on learning outcomes in mixed learning. They in no way think of a mixed learning plan as part of an innovative learning approach, including the use of innovations in school learning. As adopting an innovative learning approach with innovations in education and learning, it is important in this exam to identify their relationship with learning potential that combines a wide variety of student factors (Kintu, Zhu, and Kagambe, 2017).

2.7. Impact of Blended Learning on Teaching and Learning During COVID- 19

Research focusing primarily on worldwide pandemics and learning resources in COVID-19 has been on the surge in 2020- 2021. Some researchers published studies on the understanding needed to implement technology during the COVID-19 downturn. For instance, Agnoletto and Queiroz (2020) in their COVID-19 study presented difficulties in engaging learners that virtual learning is not easy, but there are growing demonstrations about the implementation of emergency operations tools, mainly by embracing the use of digital technologies for learning. The COVID-19 outbreak has converted face to face students' learning into blended learning (Mulenga and Marban, 2020).

Furthermore, Burke (2020) points out that some measures should be taken during the COVID-19 educational institute's closing era in an attempt to transform learning. These include ensuring contact with pupils, guardians, educators via e-mail and cell phones; maintaining access to information and knowledge such as Online Websites (e.g. Google Drive, cloud, Dropbox) educational websites, MOOCS, Ever note, or social networking platforms (e.g. Snap chat, Reddit, Google, Instagram, Facebook, YouTube) and retain access to information via cloud storage with databases and backup in places other than colleges (Burke, 2020).

Hybrid learning combines online and in-person learning to improve the learners' experience and assure learning continuity during a pandemic (UNESCO, 2020). UNESCO has also recommended the following major initiatives in addition to this definition. -determine whether hybrid learning is a viable option, Define hybrid education. Prepare to apply hybrid ideas into practice. Monitor the situation and take corrective action. A serious emergency in the form of COVID-19 forced the teachers, students, as well as parents to learn the use of educational technology and rely maximum on online applications and procedures to minimize the educational loss. This situation has luckily or unluckily made everyone computer literate. Applications such as Zoom cloud meetings, Google Classrooms, Blackboard, Nearpod, Classkick, Padlet, Mentimeter, Wheels of names, Word wall were considered as best practices. With the advent of COVID-19, teachers and students become more proficient in the use of technology. Thus, along with the numerous miseries, this coercive and unpredictable change can be seen as an opportunity for massive moves on how educators will use innovations on up-close and personal, web, and blended classroom education in the future. Blended learning, also known as hybrid learning, can keep the learning process going by allowing teaching and learning to take place in person and online as needed (Hammond, Schachner, and Edgerton, 2020). This means that if enlightened with the education technology, the educational loss can be maximized during this pandemic situation. This needs better investigation about the approaches, training the teachers and the learners about the hybrid learning approaches, ensuring the availability of the required resources, and an effective monitoring.

2.8 Factors that enhance Blended learning

2.8.1 Collaboration

In a blended learning environment, students tend to work more in groups and perform efficiently.

Studies indicate that under the guidance of adults or peers students work more in terms of problem-solving learning and potential development (Vygotsky, 1978). Furthermore, the study highlighted that scaffolding and personalizing the tasks in phases by the instructors until the learners do it independently is very significant. Assigning collaborative tasks results in developing decision making and negotiation skills in young learners.

2.8.2 Flexibility

The blend of traditional classes with e-learning provided students with the flexibility (Bonk, Kim, and Zeng, 2006). This greater flexibility suggests that students have some influence over when, where, and how they learn (Horn and Staker, 2014).

2.8.3 Communication

However, the blended learning approach is considered as a successful method for facilitating interaction (Ausburn, 2004; Rovai, 2003), because the face-to-face component brings learners together (geographically) and allows for both verbal and nonverbal communication during certain parts of the course (Osguthorpe and Graham, 2003).

As a result, it's critical for blended learning environments to create a motivating and effective learning climate (Mazer, Murphy, and Simonds, 2007), one that makes learners feel safe, accepted, and valued and encourages positive attitudes toward the course and the instructor (Mazer et al., 2007; Imbeau and Tomlinson, 2013).

2.8.4 Feedback

One of the most effective ways for supporting social and cognitive presences is to provide modest but timely instructor feedback (DeNoyelles, Mannheimer, and Chen, 2014).

In addition, studies highlight that students' experiences have been demonstrated to be influenced by fast feedback. (Ladyshew-sky, 2013).

2.8.5 Assessment

Assessments are a significant part of education. Through assessments, instructors are able to understand if the objectives are met. According to Anderson et al. (2001), assessment is a primary responsibility of the instructor.

Chapter 3: Methodology

3.1. Introduction:

Methodology refers to the systematic, theoretical study of the procedures used in research. It entails a theoretical examination of a body of methods and principles related to a field of study. Concepts like paradigm, theoretical model, stages, and quantitative or qualitative methods are commonly included (Irny and Rose, 2005). A methodology is distinct from research methods in that it does not seek to deliver solutions. The methodology thus offers the theoretical foundation for the selection of the best possible solution for a specific case.

According to Alok and Mishra (2017), the distinction between methodology and research methods is that research methods include all of the procedures and methods used to do research, whereas research methodology is the strategy used to comprehensively solve research problems. They asserted that it is a scientific investigation into the systematic conduct of research. As a result, methodology refers to the scientific approach to research that includes several processes that are often followed to investigate a research problem.

This section demonstrates the research design and approach used by the researcher to complete the study. It describes the methods and tools used to collect data and complete the analysis process. This part also tells us about the research population, the method applied for sample selections, the challenges faced by the researcher during the course of the task completion. The researcher has applied mixed techniques both for data collection and analysis.

3.2. Research Objectives

The major goal of this study was to see how effective blended learning is in the teaching and learning process. Since the world is changing rapidly, so are societal needs. Ideally, the education of a country should be what the socio-economic, and political needs of that country.

The goal of this study was to look at the success of blended learning through the lens of the education triangle, which includes parents, students, and teachers. The two main research instruments used to find answers to the proposed research questions and examine were interviews and survey questionnaires. The following were the study's main goals:

- I. To examine the effectiveness of blended learning.
- II. To assess the efficacy of blended learning vs traditional learning on the secondary school teaching and learning system in the UAE.
- III. To identify the obstacles in implementing blended learning at the secondary level in the UAE.
- IV. To determine ways (from literature and participants' responses) to improve the teaching and learning strategies and to suggest ways for future unpredictable educational challenges.

3.3. Research Questions

Research questions are a very important part of any research as these indicate the seriousness and understanding of the research about the topic and the objectives the study is meant for. Thus, it is vital to formulate the research questions very smart and meaningful. Better formulated questions appeal to the readers to go through the study. As stated by Howie JGR (1991), to ask the correct question, we need to know what we're asking about and how to keep it basic enough to be addressed but challenging enough to be intriguing.

Similarly, Isaac and Michael (1995) have mentioned that a well-stated query is a question half-answered. Thus, besides giving a good impression, thoughtfully designed questions provide a

feasible direction for data collection and analysis. For formulating logical and sound questions, one needs to have a better understanding of the issue and for that thorough study of the literature is a major source.

Following were the major research questions:

1. What are the major features of blended learning?
2. What is the significance of blended learning?
3. How effective is blended learning in teaching and learning?
4. If and how blended learning has impacted education during the COVID-19 pandemic?

3.4. Research Design:

As stated by Wellington (2015), the fundamental significance of methodology is the efficacy of assessment, explanation, and justification for the goal of the research technique, which produces the required study outcomes by acquiring adequate data. This was an investigative study in nature as it was endeavored to investigate the efficacy of blended learning, particularly during the COVID-19 pandemic. The three basic pillars of an education system in any society are Parents-Students-Teachers. Hence it was vital to consider the opinion of the three stakeholders to get better and accurate results.

The researcher decided to employ a mixed research approach for data collecting and analysis because the respondents differed in numerous ways. A mixed research method combines qualitative and quantitative research approaches, as well as viewpoints, data gathering instruments, analysis, and inference procedures, to make the job more purposeful and accessible (Johnson, Onwuegbuzie and Turner, 2007).

Additionally, Hesse-Biber (2010) identifies that initially the mixed methods research approach was more suitable for social research projects, like the one that was conducted in the 1800's in

Europe, aimed to study poverty. Participant surveys and observations, and social mapping techniques were all used in this strategy, which blended quantitative and qualitative methodologies. Similarly, Creswell (2014) takes note of the opinion that the positivist perspective is most appropriate for quantitative examination. The unadulterated reality of information concerning human conduct may never be completely perceived. It is fundamental to make a target review instrument that gives a numeric proportion of noticed practices of students by school overseers (Creswell, 2014). This deterministic way of thinking will help distinguish how a culture of politeness is being actualized and the impacts or results it has on teachers and students (Creswell, 2014).

Since blended learning requires very careful examination and is a very interesting and beneficial subject, the reasonable technique for information assortment would be mixed-method, covering both qualitative and quantitative methodologies as a result of its capacity to bring out encounters of the members in both exploratory and engaging structures (Ng and Przybyłek, 2021)

3.5. Pilot Study

The purpose of any search is to fulfill the purpose of the request (Gardner et al., 2003). This requires planning, alignment, and role-building techniques and pilot studies for the cycle (Gardner et al., 2003).

Although the pilot study is not compulsory, it is a very helpful step in any research process. It provides a better insight into the effectiveness of the formulated research methodology, particularly the research instruments. The primary goal of the pilot study is to find any potential yet unrecognized issues that may arise throughout the data gathering process. Pilot testing

verifies the content validity of data collection instruments such as questions, formats, and scales, which helps to validate the research design (Creswell,2014).

The pilot survey was carried out by delivering electronic questionnaire links prepared using Microsoft Forms and distributed to five students and teachers from a private school in UAE. The interview was arranged through Zoom meeting where the interview questions were applied as schedules. One Computer science teacher and a parent were interviewed.

The researcher tested the designed interview and survey questions on a few participants well before time from different schools. The purpose was to check the effectiveness of the instruments and to calculate about the response rate and quality of responses. These responses were used in final results as well. Cohen et al. (2005) claim that a pilot study can be effective for judging the impacts of a piece of research on participants. If a pilot study is not possible, one or two scouting sorties can be organized to examine potential problems and hazards. As a result, the researcher's credibility must be improved, and care must be taken when asking interview questions so that related interviewees react and interpret the researcher's inquiries in order to obtain as much information as possible.

The pilot study proved very advantageous as it provided a chance about the response rate as well as the effectiveness of the designed questions. There were minor mistakes in the structured questions of both the interview and questionnaire. Furthermore, it helped in reducing the errors for the main survey.

On that note, (Mc Cambridge et al.,2014) stated that using the concept of Hawthorne effect theory to measure participant feedback and evaluate data collection methods and outcomes during the pilot study allows the researcher to observe participant behavior in answering questions and understand the impact as a result of observed responses. Furthermore, determining the integrity of

the research findings enables the researcher to investigate the inconsistencies in data collection procedures (Schanzenbach, 2012).

3.6. Research Population and Sampling

The focal point of the blended mixed method is more on the selected members' capacity to explain and develop the comprehension about the issue than its representativeness. He further demonstrated that the blended methodology specialist ought to be worried about acquiring cases that can upgrade his learning interaction about public activity in a particular setting.

The figure presented below represents a stepwise explanation process for the complete procedure of research sampling and data collection. This is the simplest but well articulating description of the complete process which is given below.

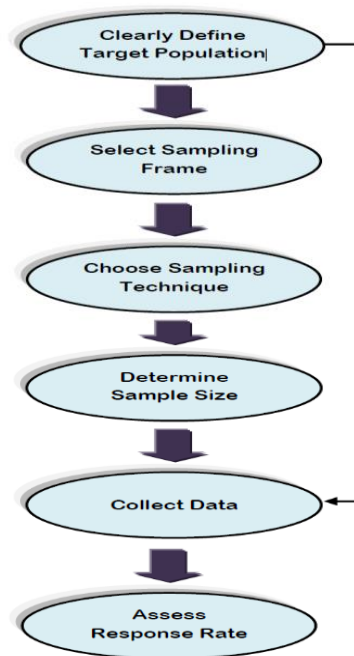


FIGURE 3. 1 SAMPLING PROCESS

Generally, these six steps are followed in the process of sampling and data collection. In the probability test, the subject is selected based on their importance as the point

of gaining a deeper understanding than the larger population (Newman, 2000). The analyst used the objective type of non-probabilistic research. Newman (2000) describes non-philanthropic research as the use of professionals working to obtain useful cases. He proved that this strategy is a very important part of the most difficult part of the research because the researcher uses areas, he is familiar with as appropriate contexts for a mixed learning effect (Rahman and Shiddike, 2020).

The target populations were the students and teachers at the secondary level. However, in this research parent's view on blended learning possessed equal importance. The researcher decided the sample size from the population that was best suitable for the target data to be obtained.

Since the research was carried out on the impact of blended learning during COVID-19, the researcher selected 72 participants for data collection through interviews and questionnaires. This sample comprised of twenty-three teachers, an equal number of students, and parents for quantitative data collection.

3.7. Sampling Procedure

There are several methods of research sampling. The researchers can adopt any depending on the nature and requirement of their study.

Taherdoost (2016) has described the sampling procedure in the following way:

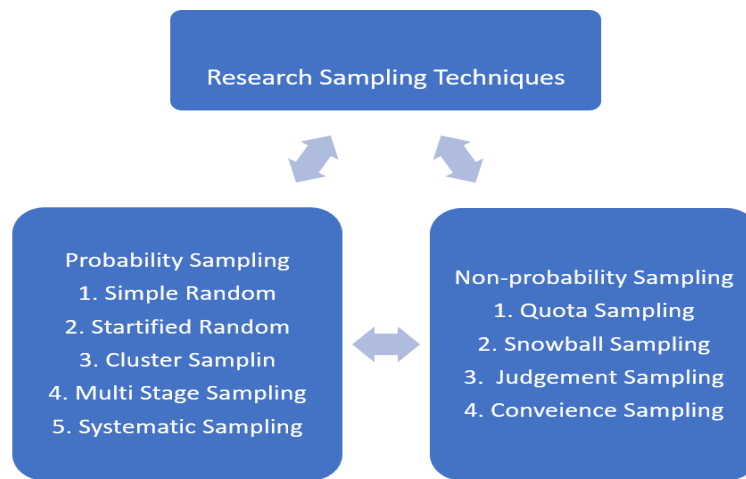


FIGURE 3 2-SAMPLING TECHNIQUES

Based on the nature of the research, the required data, and personal convenience, the researcher applied a convenience (non-probability) sampling technique for the study.

3.8. Data Collection

The data collection process was a triangulation in two very meaningful ways i.e. it was a subject related to the three angles of the education system i.e. the parents- the students- the teachers.

Likewise, the data was collected from these three pillars of the education system. Thus, the data collection process was based on the triangulation concept which best suits for getting a wide range of data and interpreting it effectively. Noble and Heale (2019) stated that triangulation is an appropriate and valid method in any research that ensures the credibility and validity of research findings. They have explained that credibility and validity refer to the trustworthiness and accuracy of the study respectively. However, according to Denzin (2007), triangulation is a technique for identifying the location of a fixed point using trigonometric principles. These laws

assert that if a triangle's one side and two angles are known, the triangle's other two sides and angles may be determined.

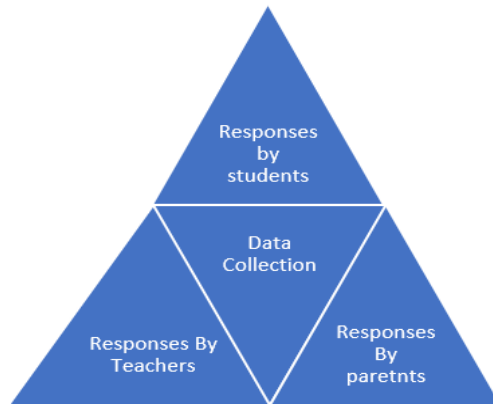


FIGURE 3- 5: TRIANGULATION PROCESS OF DATA COLLECTION

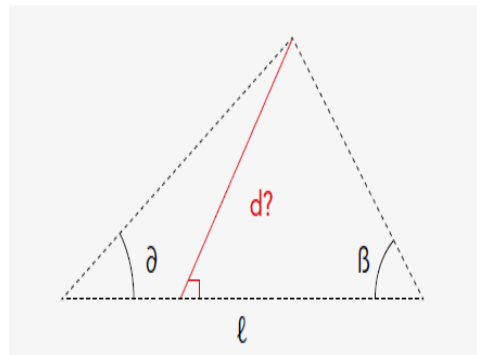


FIGURE 3- 3 :_BASIC CONCEPT OF TRIANGULATION

There are several tools that a researcher can apply in blended studies, like interviews, surveys, and meetings. These different methods of social relations data enhance each other and thereby support the authenticity and consistency of the information. The elements of the survey are mainly based on research objectives and test questions (Tomazevic, Aristovnik, and Umek, 2021). In another study, Johnson and Christensen (2008) expressed that the information assortment ought to be centered on appropriate strategies to examine the most intelligent responses to the examination questions. Utilizing a blended approach is an amazing method to investigate both logical and member viewpoints of the examination issue through the gathered information from the three chose locales.

Close-ended questionnaires and interviews were used for gathering data from students, parents, and teachers. All the participants showed high enthusiasm in taking part in the surveys and interviews. Moreover, they provided the data on time.

3.9. Data Collection Instruments

There are many types of qualitative research tools; however, the one chosen must go according to the research objectives. Observations, surveys, and interviews are among the most commonly used instruments in research.

This study was multidimensional in various aspects. i.e. there were three types of respondents. The objective was to study the impact of blended learning in the light of the COVID-19 situation. Thus, there was the need for different research instruments to get maximum qualitative and quantitative data. Among the numerous research instruments, questionnaires and interviews seemed the most suitable.

3.9.1. Questionnaire:

The questionnaire is a significant estimation instrument used to gather information from the selected participants. Using a survey as an information assortment instrument permits the analyst to accomplish study targets accurately through getting adequate data given by the participants.

As the research was conducted during the COVID-19 pandemic, utmost care and safety have been observed throughout the course of the study. As it was not feasible to survey conventionally, the researcher implemented the survey electronically using Microsoft Forms to make it convenient for the researcher and the respondents. Thus, ensuring the safety of the participants. Secondly, it was more economical to carry it online than to do so by reaching the participants physically.

The questionnaire has been decided in such a way that it raises curiosity in the respondents. Care has been taken to avoid unnecessary headings and numbers. The layout of the questionnaire has also been designed systematically and interestingly. Simple fonts were used. The questions were framed aptly and clearly, so it is easy for the respondents to understand. Care has been taken not to deviate from the research objectives of the study. Unambiguous, leading, and negative queries were avoided.

The teacher and student survey questions were adapted from the survey questionnaires of Garrison and Vaughan's (2008) book.

3.9.2. Interview

Interview is one of the extensively utilized methods in qualitative research. It is the method and location of a social interaction in the form of a discussion between the interviewer and the participant with the express purpose of acquiring unquantifiable data such as the participants'

perceptions, encounters, and experiences, which contributes to an extensive data collection (Ryan et al., 2009). Interview is the optimal tool in qualitative research to get as much about the issues as required and as the researcher wants to get.

Knox and Burkard (2009) in a study about qualitative research interviews have discussed in detail the innate qualities for a successful interview. The authors asserted that regardless of whether an interview was structured, semi-structured, or unstructured, a key criterion for success stemmed from the rapport between the researcher and the interviewees.

As highlighted by McIntosh and Morse (2015, p.1), a nearby finished meeting is a subjective examination technique "intended to determine emotional reactions from people in regards to a specific circumstance or marvel they have encountered".

The researcher conducted detailed interviews with teachers, parents, and students. The interview questions were semi-structured. Furthermore, McIntosh and Morse (2015) mentioned that a semi-structured interview is a qualitative research method, for eliciting subjective comments from people on a situation or event they have encountered.

As it was difficult to arrange face-to-face meetings in light of the COVID-19 situation, appointments were fixed in advance and the interviews were conducted through Zoom meetings.

3.10 Data Analysis

The quantitative data were analyzed with the help of Microsoft Excel. The mean and standard deviation of the obtained facts and figures were calculated with the help of formulas in Excel. Pie charts and bar charts were designed for visually representing the data using the Charts feature in Microsoft Excel.

Data analysis of the qualitative data was done through thematic analysis. Thematic analysis, according to Braun and Clarke (2006), should be a basic method for qualitative analysis since it teaches core skills that can be applied to a variety of qualitative study kinds. Despite the fact that a rigorous thematic analysis can produce dependable and insightful results (Braun and Clarke, 2006), there appears to be no consensus on how researchers should utilize the method in a systematic way. Thematic analysis is a highly adjustable method that can be customized to the needs of a wide range of studies, producing a rich, detailed, but complex account of data (Braun & Clarke, 2006; King, 2004). Since thematic analysis does not require the same level of theoretical and technological skill as other qualitative approaches, it is a more accessible form of analysis, particularly for those just beginning their research careers (Braun and Clarke, 2006).

In short, the following figure shows how the study was carried out.

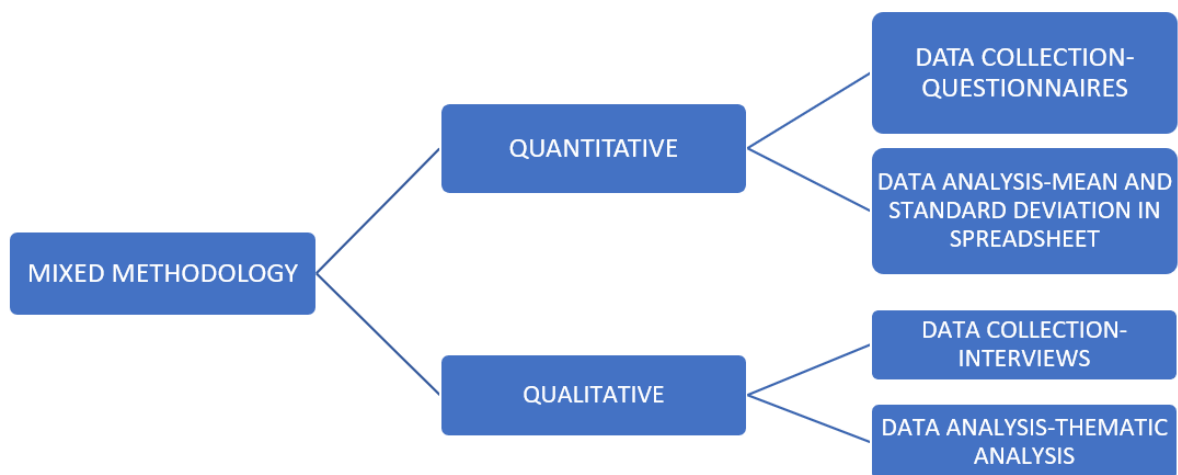


FIGURE 3- 6 : MIXED METHODOLOGY

3.11. Reliability and Validity

Among the basic terms related to research, the two frequently used are validity and reliability.

These are the concepts that are related to the quality of research. According to Knapp (2008), validity is a measurement phrase that originally indicates the effectiveness of a measuring instrument for a certain purpose, but it has now been expanded to include a complete research project.. In short, it indicates how effectively a method measures what it is supposed to measure.

Besides getting maximum data, a mixed research approach assures the validity and reliability of the obtained data and makes the analysis process convincing.

Mertens (2014) stated that the blended methods approach facilitates the concept of a validation procedure and demonstrating the validity and reliability of the gathered data in order to make necessary adjustments by validating the efficacy and correctness of the research objectives. The researcher employed a mixed research approach. Besides it the data was collected online that reduces the subjectivity and bias as claimed by Chang and Vowels (2013).

3.12. Challenges

This section deals with the challenges the researcher faced during the data collection and analysis stages. The most important test was the COVID-19 outbreak, which was declared a pandemic by the World Health Organization.

The unexpected eruption of the COVID-19 pandemic turned into the main test for the analyst. Upgraded wellbeing measures, alongside friendly separating conventions, were actualized and all learning and exploration exercises were adjusted for the online conveyance or electronic stages. Additionally, as numerous students are in high danger, leading up close and personal intuitive

meetings and the typical appropriation of surveys was confined incidentally. Hence, it was important to lead interviews utilizing email and calls.

Ultimately, the researcher minimized the shortcomings by employing multiple research tools, effectively utilizing the education technology, and by the inclusion of the major stakeholders into the investigation.

3.13. Ethical Consideration

The fruitfulness of the research depends on the way the researcher approaches his studies and it has to be designed through fair means. It's not a mere collection of data, but finding the knowledge and truth with integrity. Ethics refers to the professional rules and guidelines that guide the researcher in his interactions with participants. It determines whether an educational research study succeeds or fails. The subjects should not be harmed in any manner by the researchers (Berg and Howard, 2012).

In social research, the investigator must be faithful not only to the profession in his or her pursuit of knowledge and truth, but also to the subjects on whom he or she relies for data collecting. Whatever the nature of their work, social researchers must consider the research's effects on participants and operate in such a way as to maintain their dignity as human beings. This is an example of ethical behavior (Cohen et al.,2000).

The researcher was enlightened about what to do and what not to during the whole course of this study. There are some generally defined ethical rules for the effective and smooth conduction of any research. The consent form is attached in the appendices. Microsoft forms questionnaires were used. The participants were first asked to fill up the mandatory consent form. The questionnaire was designed in such a way that only after filling up the consent form they were allowed to take

the survey. Before the data collection participants were informed about the purpose of the study. The participants had the right to withdraw from the study at any time. Participants were ensured that the data collected would be confidential and would be stored securely. There were no risks associated with the study. Leading questions were avoided during the data collection process. The participants were not compensated and did not pay to participate in the study. As there is a vulnerability of the data to be leaked while storing in Cloud-based systems, the files were password-protected. Utmost care was taken to protect the participant's identity.

3.14. Conclusion

This part of the study focused on the philosophy and research methodology. It highlighted the mixed-method examination as a technique for information assortment and investigation and also the reasons behind the selection of this blended method. Measures followed during the information assortment were examined in this part.

Chapter 4: Findings

4.1 Introduction

This is the central part of the study comprising of the collected data and its presentation. The data collected through surveys and interviews are interpreted in this chapter. The presentation of the research questions along with the responses is interpreted to show the understanding of parents, teachers, and students about the efficacy of blended learning. The questions were distributed via Microsoft Forms and the statistical interpretation was done on Microsoft Excel as well as graphs. The semi-structured interview responses were analyzed thematically.

4.2. Response Rate

The sample for this study was 69 respondents which included 23 parents, 23 teachers, and 23 students. Different questions were framed for all respondents and their responses/ answers have been discussed. Category-wise responses have been graphically represented. The questionnaire was designed to achieve responses both in favor and against the method of teaching. Responses collected for each question have been summarized in tabulated and appended below for further discussion.

Sample Category	Sample Size	Responded	Not Responded	Questionnaire
Teachers	23	21 (91%)	2 (9%)	Questions have been attached as appendices
Parents	23	22 (95%)	1 (5%)	
Students	23	22 (95%)	1 (5%)	
Total	69	65 (94%)	3 (6%)	

TABLE 4-1: RESPONSE RATE

The above table shows the data that 94 percent of the population responded to the questionnaire and only 6 percent did not respond.

4.3 Quantitative Data

The questionnaires consisted of a 4-point Likert scale (strongly disagree =1, disagree =2, agree =3, strongly agree =4) questions. MS Excel was used to calculate standard deviation and mean . The questionnaire was almost similar for all the respondents, hence results and findings were calculated on the same structure. Findings of the survey received from teachers, students and parents were separately analyzed as per the designs of questions.

Survey Findings

4.3.1 Data collected from Teachers

The questionnaire was designed to ascertain the feasibility of a blended learning system. Respondents were categorized into teachers, parents, and students. Feedback/ responses collected have been represented in tabulated form.

Q1. Does blended learning allow students to learn through their own pace?

Majority of the teachers (85%) have strongly agreed that students could learn lessons through their own pace in different tasks.

N	Mean	SD
21	3.2	0.59

TABLE 4-2: TEACHER RESPONSE RATE

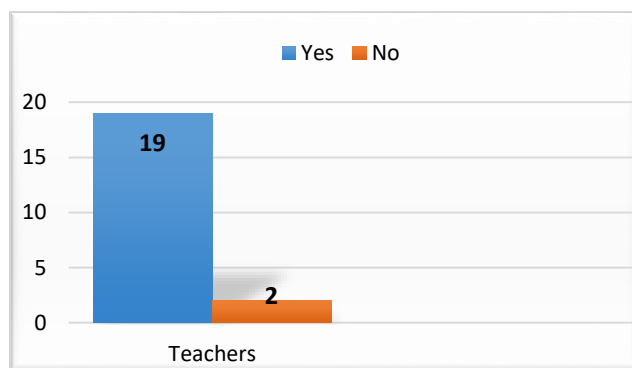


FIGURE 4- 1 :RESPONSE RATE

The mean and standard deviation for this question are 3.2 and 0.59 respectively.

Q2. Does blended learning allow a range of teaching methods?

Data depicts that maximum teachers have agreed to it. Mean and standard deviation are 3.5 and 0.67 respectively.

N	Mean	SD
21	3.5	0.67

TABLE 4-3: TEACHER RESPONSE RATE

Q3. It is about using computer platform to manage student's learning?

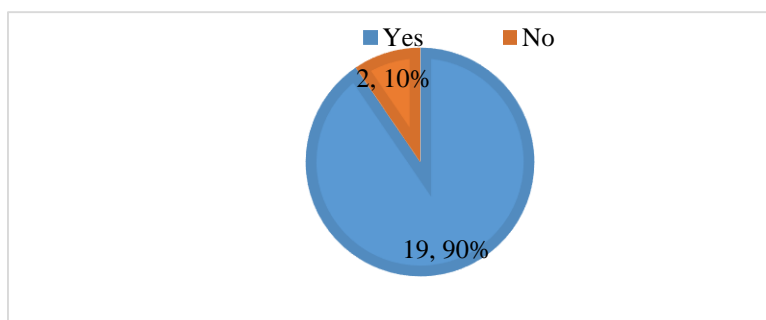


FIGURE 4-2 : TEACHER RESPONSE RATE

90% of respondents have agreed that blended learning has added to the improvement of learning process. Mean and standard deviation are 3.5 and 0.68 respectively.

Sample Category	Responses	Mean	SD
Teachers	21	3.5	0.68

TABLE 4-4: TEACHER RESPONSE RATE

Q4. Is it more economical measure of teaching?

Sample Category	Responses	Mean	SD
Teachers	21	3.5	0.68

TABLE 4-4: TEACHER RESPONSE RATE

Mean score is 3.5 and 3.4 and standard deviation came out to be .68 .

Q5. Is there any dedicated teaching and learning website developed by your faculty/ school/ department?

71 percent respondents have responded that the schools have developed some kind of software to encourage blended learning and only 29 percent had not worked on this aspect.

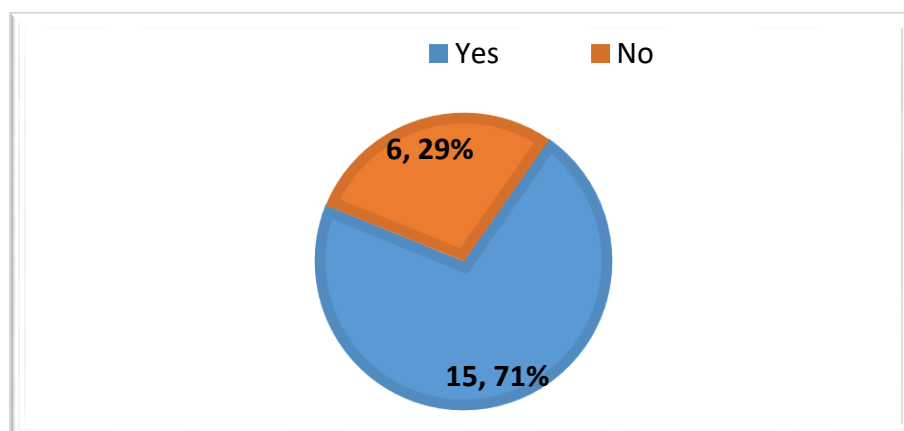


FIGURE 4- 3: TEACHER RESPONSE RATE

Q6. Does blended learning make students autonomous?

Responses collected regarding above question are described statistically which shows that the mean and standard deviation were calculated as 3.1 and 0.58 respectively.

Sample Category	Responses	Mean	SD
Teachers	21	3.1	0.58

TABLE 4-5: RESPONSE RATE

Q7. How effective is online teaching?

In order to find answer to this question respondents were given parameters which were used as helping tools to find out the weightage of online teaching. These factors were graded as per Likert scale and accumulated mean and standard deviations were worked out.

It was revealed that students can easily follow their courses through online programs. It also provides easy access to required data and information. Students can find answer and clarifications to their queries. It was found to be user friendly and same was also supported and agreed by teachers. Availability of numerous interesting post cards and videos in the form of animations and lectures made online teaching more interesting and it also met the requirement of students. Online teaching and learning process was experienced as a new and unique way of teaching. It also helped the management in carrying out the evaluation of students. Furthermore, teachers also agreed that online teaching has improved learning process and students have become more responsible. They also agreed that students could easily assimilate lessons and it also increased their motivational level. Majority of the teachers agreed that students have shown better performance in exams. It also provided a comfortable and conducive environment for learning. Students also acquired

proficiency in use of IT equipment. It was highlighted by teachers that they could not pay attention to each student and they also faced technical and connectivity issues sometimes. The data is tabulated. Mean and SD are 3.4 and 0.75 respectively

Sample Category	Responses	Mean	SD
Teachers	21	3.4	0.73

TABLE 4-6: TECHNOLOGY RESPONSE RATE

Q8. How effective is face to face session?

In order to find answer to this question certain factors pertaining to face to face session were evaluated by teachers. It was found that majority of teachers strongly agreed that class room activities helped students understand their lessons easily. Teachers could monitor, clarify and correct their mistakes. Discussions during class provided opportunity for the students to learn the contents of a unit in detail. Teachers agreed that face to face learning has created a sense of competition. Moreover, it was also agreed by the teachers that it helped students retain knowledge for long time.

Sample Category	Responses	Mean	SD
Teachers	21	4.1	0.66

TABLE 4-7: TEACHER RESPONSE RATE

Mean and standard deviation for Q8 are 4.1 and 0.66 respectively.

Q9. In technology adoption, under which category do you fall into?

This question was designed to have a fair knowledge of teachers' proficiency level in technology adoption. 57 % of teachers fall in innovators category, 19 % are early adopters and 24 percent fall in the category of early majority.

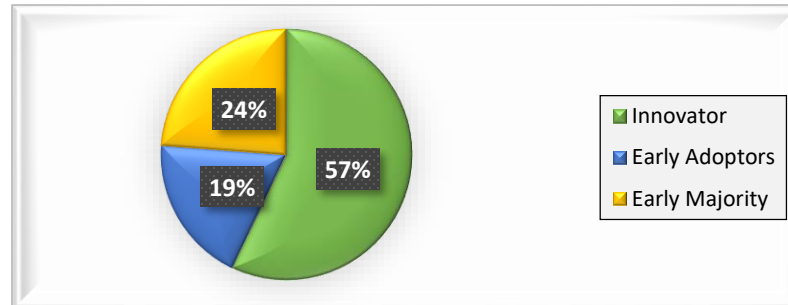


FIGURE 4-4 : TECHNOLOGY ADOPTION RESPONSE RATE

4.3.2 Data Collected from Students

Q 1. Did you have knowledge or experience of using blended learning prior to attending this course module?

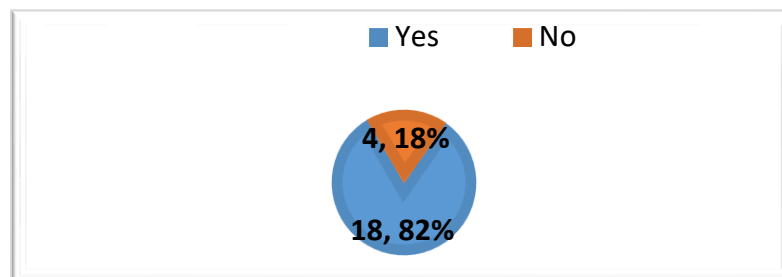


FIGURE 4- 5: STUDENT RESPONSE RATE

It was found that 82% of students were having experience of blended learning whereas 18 percent of respondents did not have any experience of blended learning.

The mean and standard deviation calculated for this question were 5.2 and 0.87 .

Sample Category	Responses	Mean	SD
Students	22	5.2	0.87

TABLE 4-8: STUDENT RESPONSE RATE

Q2. Do you think you have sufficient training and guidance in the use of blended learning methods?

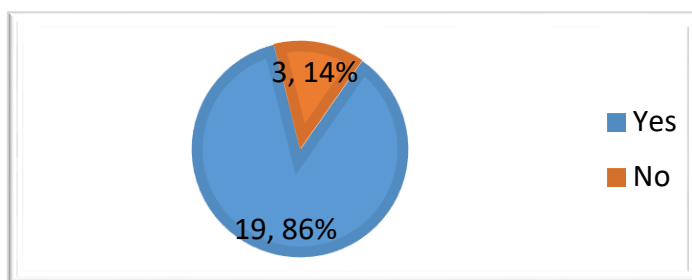


FIGURE 4- 6: STUDENT RESPONSE RATE

It was found that maximum students (86%) had sufficient training and guidance in t blended learning and statistically it was also calculated as below.

Sample Category	Responses	Mean	SD
Students	22	5.2	0.87

TABLE 4-9 : STUDENT RESPONSE RATE

The mean and standard deviation calculated for this question were 5.2 and 0.87.

Q3. Is the blended learning teaching method sufficiently explained in a module handbook?

82 percent students were conversant with the methodology mentioned in their handbook and only 18 percent were not aware.

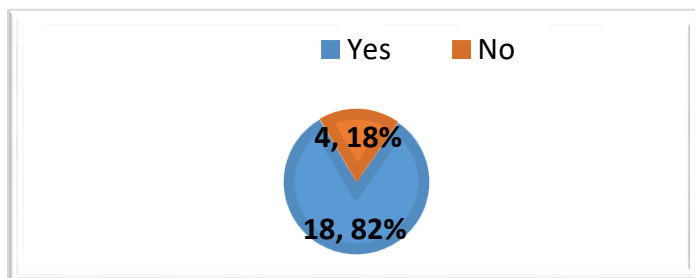


FIGURE 4- 7: STUDENT RESPONSE RATE

Q4. Does a module handbook provide sufficient resources for this specific blended learning?

77 percent of students strongly agreed and 23 percent agreed.

Sample Category	Responses	Mean	SD
Students	22	4.6	0.81

TABLE 4.10: STUDENT RESPONSE RATE

The mean and standard deviation for this specific question were calculated to be 4.6 and 0.81 respectively.

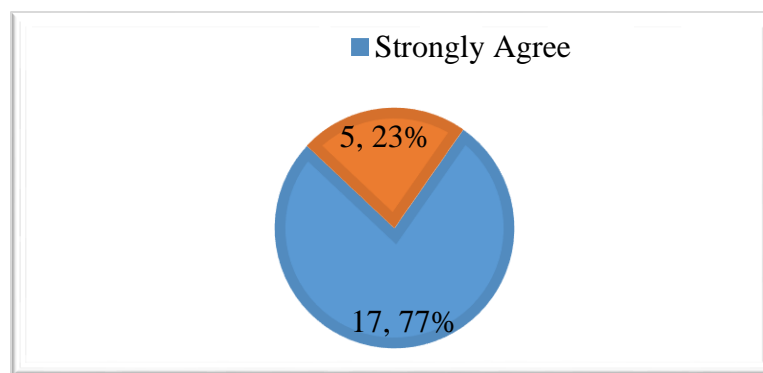


FIGURE 4-8: STUDENT RESPONSE RATE

Q5. According to your opinion, please identify the advantages for using blended learning as a teaching method.

Respondents	Opinions/ feedback
1, 3, 5	Flexibility of being able to complete assignments any place/any time
6,7, 13	It was the only available option course that fits into my timetable
9,10,11,12	Convenience of not having to come to campus as often
13,2,8	It is a required course/module
14,4	It was the only available option course that fits into my timetable
15,16	Can provide easy access to required data
17	This type gives flexibility in presenting content.
18	Comfort of both teacher and student
19	More economical
20	Effective during pandemic
21	Students pays more attention
22	You don't have to travel a long way for school, study from home

TABLE 4.11: STUDENT RESPONSE RATE

Q6. What is the most effective aspect of blended learning?

Respondents	Opinions/ Feedback
1	Interactive session
3	Course effective during pandemic
5	Flexibility
4	Enhance communication and engagement
6	Blended learning helps students to be technically advanced
8	Saves a lot of time
7	Complex topics can be presented in the classroom, while other subject matter can be available online.
11	Comfort of both teacher and student
13	Enhance communication and engagement
14	Students pays more attention

TABLE 4.12: STUDENT RESPONSE RATE

Q7. What is the least effective aspect of the use of blended learning as a teaching method?

Respondents	Opinions/ Feedback
1	Not able to meet in person
2	Individual attention
3	Visit to school
4	Technology can be challenging
5	Nothing as such
6	Technical issues like connectivity / bad weather
7	Blended learning makes teachers overwork
8	A classroom feel
9	technology can be challenging
10	Teachers unaware of students absence in class
11	If you wake up late you will miss out the lectures and you can't help that out. Your sleeping routines gets spoiled
12	Flexibility
13	guidance and suggestions
14	We will learn at least one of several different types of things.
15	High maintenance cost. It can be highly technology and wastes some time
16	No practical learning. No effective interaction between students and teachers.
17	Long lectures

TABLE 4.12: STUDENT RESPONSE RATE

Q8. What suggestions you can provide to help strengthen blended learning module?

Respondents	Opinions/ Feedback
1	Inclusion of fun based lessons
2	Additional interactive sessions
3	Focus on digital well being
4	Focus on digital well being
5	Design course to make the student motivated and on-track
6	Include only practical based questions of all aspects so that learning is more fun rather
7	Designing activity-oriented course
8	Using cameras
9	There should be less assignments and more of learning in the class itself
10	to give internet free to all students
11	Design fun based courses
12	Keep struggling with the same kinds of things and ideas constantly for the sake of getting
13	Clearly identified the goals and create a outline. It can be motivated a learners. It can
14	Introduce effective mode of examination.
15	Make it student centered with more activities

TABLE 4-13 : STUDENTS RESPONSE RATE

4.3.3 DATA COLLECTED FROM PARENTS

Q1. DOES BLENDED LEARNING ALLOW STUDENTS TO LEARN THROUGH THEIR OWN PACE?

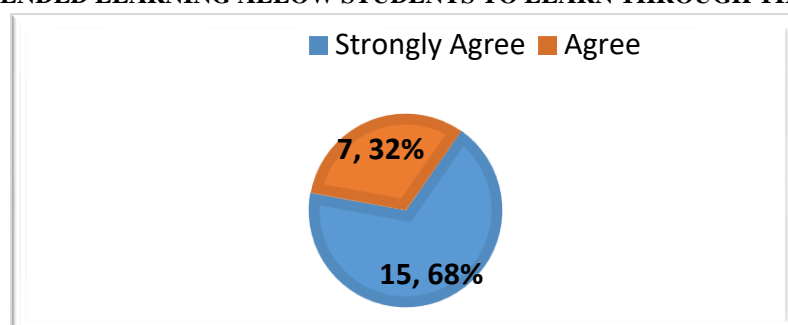


FIGURE 4- 9:PARENT RESPONSE RATE

Majority of the parents (68%) have strongly agreed that students could learn lessons through their own pace in different tasks.

Sample Category	Responses	Mean	SD
Parents	22	4.3	0.78

TABLE 4-14 : PARENTS RESPONSE RATE

The mean and standard deviation calculated for this question were 5.2 and 0.87.

Q2. Does it mean using a range of teaching methods?

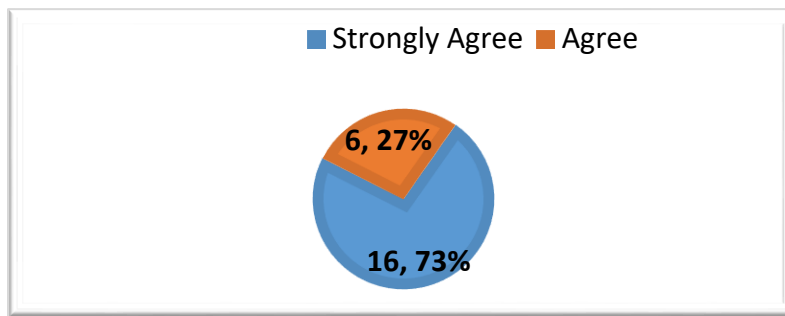


FIGURE 4-10: PARENT RESPONSE RATE

73 percent parents have strongly agreed that blended learning is a range of teaching methods.

Sample Category	Responses	Mean	SD
Parents	22	4.5	0.79

TABLE 4-15: PARENTS RESPONSE RATE

The mean and standard deviation calculated for this question were 4.5 and 0.79 .

Q3. Is blended learning about using computer platform to manage students' learning?

59 percent parents have strongly agreed and 41 percent have agreed for Q3.

Sample Category	Responses	Mean	SD
Parents	22	4.5	0.79

TABLE 4-16 :PARENTS RESPONSE RATE

The mean and standard deviation calculated for this question were 4.5 and 0.79.

Q4. Do you think there are other characteristics of blended learning? If so please specify.

Respondents	Opinions/ Feedback
1	More flexible teaching and learning environment
3	Single attention
5	Flexibility
4	Blended learning provide kids to have enough break and rest.
6	No time limit
8	Different approach to conventional learning methodologies
9	Better paced and independent learning
10	The learning doesn't stop when you leave the classroom
11	Helps to continue education regardless of barriers
12	Its safe during pandemic

TABLE 4-17 :PARENTS RESPONSE RATE

Q5. Has blended learning been very effective for your child?

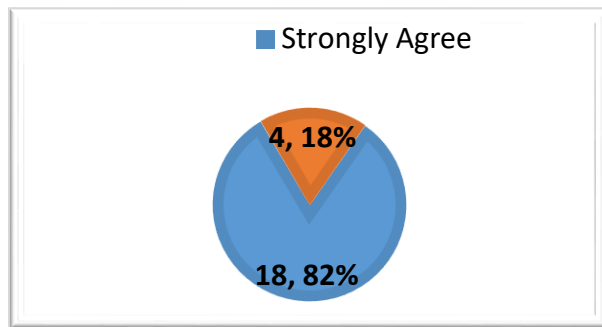


FIGURE 4. 11: PARENT RESPONSE RATE

Sample Category	Responses	Mean	SD
Parents	22	3.4	0.72

TABLE 4-18 :PARENTS RESPONSE RATE

82 percent parents have strongly agreed and 18 percent have disagreed for Q5.

Q6. Do your child has other needs in terms of dealing with web technology? If so please specify.

Respondents	Opinions/ Feedback
1	Quality compromising
3	No
5	NO
4	Nothing in particular
6	This generation kids have very high grasping capacity. Need to give attention for special kids and differentially abled kids. New technologies to involve them also in blended
7-22	No

TABLE 4-19:PARENTS RESPONSE RATE

Q7. In comparison to the traditional class room teaching, how would you describe the quality of interaction between students and teachers during COVID-19?

Respondents	Opinions/ Feedback
1	Decreased
3	Somewhat decreased
5	Increased
4	Somewhat increased
6	Somewhat decreased
7	Increased
8	Somewhat decreased
9	Increased
10	Somewhat decreased
11	No
12	No
13	Increased
14	Somewhat decreased
15	Increased
16	Somewhat decreased

TABLE 4-20: PARENTS RESPONSE RATE

Q8. Does your child enjoy going to school each day?

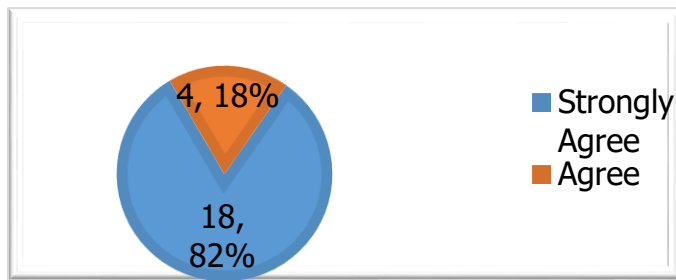


FIGURE 4- 12: PARENT RESPONSE RATE

It is evident from the data that 82 percent have strongly agreed and 18 percent have agreed. Mean and SD for question 8 is 4.4 and 0.91 respectively.

Sample Category	Responses	Mean	SD
Parents	22	4.4	0.91

TABLE 4-21 : PARENTS RESPONSE RATE

Q9. Does the school has high learning standards for all students?

For Q9 Mean and standard deviation are 2.8 and 0.44 respectively.

Sample Category	Responses	Mean	SD
Parents	22	2.8	0.44

TABLE 4-22 : PARENTS RESPONSE RATE

Q10. Do teachers have a process to ensure the concepts are retaught in a new way or utilize a different approach to learning, when students struggle with learning?

For Q10 Mean and standard deviation are 2.8 and 0.48 respectively.

Sample Category	Responses	Mean	SD
Parents	22	2.8	0.48

TABLE 4-23 : PARENTS RESPONSE RATE

Q11. Is there any teacher, counselor, or other staff members to whom a student can approach for help with a school problem?

For Q11 Mean and standard deviation are 2.8 and 0.44 respectively.

Sample Category	Responses	Mean	SD
Parents	22	2.8	0.44

TABLE 4-24 :PARENTS RESPONSE RATE

Q12. Does blended learning environment at school is stimulating and leading to holistic development of child?

For Q12 Mean and standard deviation are 3.5 and 0.64 respectively.

Sample Category	Responses	Mean	SD
Parents	22	3.5	0.64

TABLE 4-25 :PARENTS RESPONSE RATE

Q13. Are the school's learning standards and expectations clearly explained to students?

For Q13 Mean and standard deviation are 3.8 and 0.72 respectively.

Sample Category	Responses	Mean	SD
Parents	22	3.8	0.72

TABLE 4-26 :PARENTS RESPONSE RATE

Q14. Do teachers give timely feedback about students' work?

For Q14 Mean and standard deviation are 5.1 and 0.84 respectively.

Sample Category	Responses	Mean	SD
Parents	22	5.1	0.84

TABLE 4-27 : PARENTS RESPONSE RATE

Q15. Do teachers and other school staff communicate effectively with you as a parent?

For Q15 Mean and standard deviation are 2.3 and 0.45 respectively.

Sample Category	Responses	Mean	SD
Parents	22	2.3	0.45

TABLE 4-28 :PARENTS RESPONSE RATE

Q16. Do you receive sufficient information about meetings, activities and opportunities for participation at this school?

For Q16 Mean and standard deviation are 4.3 and 0.54 respectively.

Sample Category	Responses	Mean	SD
Parents	22	4.3	0.54

TABLE 4-29 :PARENTS RESPONSE RATE

Q17. Do you feel that you are a full partner in the education of your child and have input into the decisions that affect your child?

For Q17 Mean and standard deviation are 2.7 and 0.64 respectively.

Sample Category	Responses	Mean	SD
Parents	22	2.7	0.64

TABLE 4 -30 :PARENTS RESPONSE RATE

Q18. Blended learning been very effective for your child?

For Q18 Mean and standard deviation are 4.8 and 0.94 respectively.

Sample Category	Responses	Mean	SD
Parents	22	4.8	0.94

TABLE 4-31 :PARENTS RESPONSE RATE

Q19. Are you satisfied with the quality of education that your child is receiving during bended learning?

For Q19 Mean and standard deviation are 3.8 and 0.66 respectively.

Sample Category	Responses	Mean	SD
Parents	22	3.8	0.66

TABLE 4-32 :PARENTS RESPONSE RATE

Q20. Remarks/ Suggestions on Parent School Partnership if any.

Respondents	Suggestions/ Feedback
1	Blended learning has shown great impact on students where students need are focused and flexibility is given in large scale
2	My child is connected to school through blended learning
3	All students are not the same it has helped some and it's not helped the other half pandemic has taken education to the doors
4	I feel my child is safe
5	My child enjoys going to school rather than fully online classes

TABLE 4-33 :PARENTS RESPONSE RATE

4.4 Qualitative Data

Qualitative data was collected through semi-structured interviews. Interviews were conducted from a student, teacher and parent and the collected data was analyzed. Interviewees have been numbered instead of names as per their consent. Below are given the findings for the major research questions along the sub-questions (interview questions from a teacher, a student, and a parent). For convenience, tables were made.

Findings for Research question 1: What are the major features of blended learning?

Respondent	Response
Teacher	<p>“Well, blended learning has got lots of positive impact in the area of teaching. Purely distant (e learning) education has reduced interaction with peers as well as the teacher. I feel that blended learning is flexible as well. With blended learning I believe that students are more focussed and it is possible to incorporate active learning .It also helps in improving the 21st century skills. Giving feedbacks face to face is more effective than in a virtual environment. Yes, students stay focussed and are engaged in the activities than in a purely distant classroom environment.”</p>
Student	<p>Absolutely. I was really bored with the system of complete e-learning system. However, with blended learning I am able to focus on my studies. I am happy that I am able to come to school and meet my friends.</p>
Parent	<p>I feel that my child is connected to the school. Hence to a certain extent my child enjoys the presence of teachers and friends.</p>

TABLE 4-34: INTERVIEW

Findings for Research 2: What is the significance of blended learning?

Respondent	Response
Teacher	“Yes, students stay focussed and are engaged in the activities than in a purely distant classroom environment”.
Student	“Well I agree that blended learning has given me chances to interact with my friends and teachers. I find that my teachers’ feedback is more effective in blended learning. As in assessments, I feel that we students prepare more and take it seriously in blended learning”.
Parent	“Yes. I find my child more engaged in this type of learning environment”

TABLE 4- 35: INTERVIEW

Findings for Research Question 4: If and how blended learning has impacted the education during the COVID-19 pandemic?

Respondent	Response
Teacher	Also, in the COVID 19 situation, if a student or teacher tests positive it brings a lot of fear in others. Yes. I would recommend that teachers should be given proper training for designing the course.
Student	“Absolutely. I was really bored with the system of complete e-learning system. However, with blended learning I am able to focus on my studies. I am happy that I am able to come to school and meet my friends”.
Parent	When some students get positive, as a parent I get the fear if my kid is infected. I am worried about the safety. Other than that I don’t find any.

TABLE 4-36:INTERVIEW

The interview questions were thoughtfully designed to find answers for the major research questions from the participants. The objective was to know the respondents’ opinion was aimed opinion about blended learning. All of them appreciated blended earning for many of its features like flexibility motivational factor, effective assessment and timely feedback. The participants also

appreciated blended learning as according to them, it is an approach for improving the teaching and learning system.

4.5 Thematical Analysis

Findings of questions were read and carefully analyzed to ascertain different aspects of blended learning. Factors like effectiveness, motivation, students and teacher's engagement, learning process, clarification of queries, cost effectiveness of blended learning, student's interest in learning, familiarization with technological advancement, user friendly, effectiveness of face to face sessions and so on were amply covered. It was clear from the data collected through questionnaire and interviews that, all the respondents supported blended learning.

Generated Themes

Themes	Codes
Blended learning	Definition
Advantages of blended Learning	Flexibility
Advantages of blended learning	Technology Adoption
Advantages Of blended learning	Collaboration
Role of Blended Learning during COVID_19	COVID_19 and Blended learning
Advantages Of blended learning	Motivation

TABLE 4-37: THEMES FROM PARTICIPANTS' QUALITATIVE DATA

Chapter 5 Discussions

5.1 Introduction

This last part of the study deals with the discussion of quantitative and qualitative analysis of the main research questions through the responses by the three categories of the participants i.e. Teachers, Students, and Parents. This is divided into two parts i.e. (1) The qualitative analysis of the responses and (2) the quantitative analysis of the survey responses. In this part of the study we will try to analyze the four research questions through the responses of the participants. But for making the concept clearer the researcher has blended these responses with relevant literature with specific headings. The findings from the semi-structured interviews were given codes and meaningful themes were generated like 1) advantages of blended learning (Motivation, Flexibility, Collaboration, effectiveness, and Effective assessment and feedback, and 2) Technology in Education and, 3) Role of blended learning during COVID_19. Below is the discussion on the interview questions, while the interview questions, the responses, the themes and codes are given as Appendix IV, V VI.

5.2 Qualitative Analysis of the Interview Data

5.2.1 Discussion of Teachers' Responses

Research Question 1: What are the major features of blended learning?

Research Question 2: What are the significance of blended learning?

Motivation

In the interview part, this question was asked from a teacher under 3 questions i.e. Q3, Q4, and Q6. The responses to these three questions by the teacher revealed that blended learning has improved the learning process of students. It has created interest and elevated motivational level of students. The interesting finding is that student tend to communicate verbally and non- verbally more in a blended learning environment. These results are consistent with those of the studies by Osguthorpe and Graham (2003).

The effectiveness of blended learning is impacted by a number of known and unknown factors that pose challenges. One among the major challenges is the way users use the required procedures, steps, and resources. One very important resource is technology and the successful use of technology and participants' commitment towards its use is a decisive factor in making the learning successful. Users getting into difficulties with technology may result into abandoning the learning and eventual failure of the blended approach (Hofmann, 2014).

Effectiveness of Blended Learning in Teaching and Learning

Research Question 3: How effective is blended learning in teaching and learning?

This research question was asked from the teacher under the interview Q3. From the findings of teachers data it was revealed that success rate is increased through use of blended learning. Blended learning has eased up the tasks of learners by providing easy access to required data and information. Students can find answer and clarifications to their queries. It was found to be user friendly and same was also supported and agreed by teachers. The effectiveness of blended learning is not merely confined to internet or computers, or personal interest and ability, there are several other factors that needed to be taken into account while analyzing the outcomes of blended

learning. Thus besides gender, age, experience, time management, aspects like family and social background and support, self-regulation, attitudes towards blended learning and management of workload also determine the effectiveness of blended learning (Morris and Lim , 2009).

As mentioned by Bonk, Kim, and Zeng (2006) the respondents identified flexibility as an advantage of blended learning. The responses provided ultimate flexibility in presenting content. Complex topics can be presented in the classroom, while other subject matter can be available online.

One another finding is that teachers reported that for an outstanding lesson , the learning environment is equally important .These are in agreement with the study of Mazer, Murphy, & Simonds (2007).

Assessments are inevitable in the education process .One significant result is that blended learning provided better assessment opportunities than in an online classroom .These results support the idea of Anderson et al. (2001) .

Perhaps the most striking finding is that teachers reported that timely feedbacks are possible in a blended learning environment. These results are in line with those of (DeNoyelles, Mannheimer, & Chen, 2014). In addition, teachers reported that feedbacks have enhanced the student performance. These support the ideas of (Ladyshe-wsky, 2013).

Furthermore, teachers also agreed that online teaching has improved learning process and students have become more responsible. They also agreed that students could easily assimilate lessons and it also increased their motivational level. It also provided a comfortable and conducive environment for learning. Face to face learning has improved their confidence level online teaching has made them learn.

Research Question 3: If and how blended learning has impacted the education during the COVID-19 pandemic

Role of Blended Learning during COVID-19

This theme was covered under teachers interview Q4 and Q7. COVID-19 badly affected the education system. Teaching and learning in a conventional way was not possible due to the pandemic. Some of the aspects which could be correlated with pandemic and blended learning are listed below. As suggested by Horn and Staker (2000), the participants found that blended learning gave the freedom and flexibility to learn . The findings also say that all the participants agree to the point that through blended learning learners feel they are valued more and are in an inclusive learning environment. These results further support the idea of (Mazer et al., 2007; Tomlinson & Imbeau, 2013).

Technology in Education

This was not included in the major research question, but while conducting the research, the researcher found that there is paramount value of technology in education, thus questions were framed both in the survey and the interview questions. In the interview part, this was corresponded under Q7 and Q8.

There was a major part in study under literature about the attitude of teachers towards the acceptance of technology. The reason for asking this question exclusively from teachers is that students usually look for new trends in learning and adopt eagerly as at that stage of life these inventions attract the much and they can easily learn it. This was the main question in the survey from teachers to check at what stage do they fall in the use of technology. This questions in the survey meant to know the participants opinion about the use of technology in education, its advantages, disadvantages, and the challenges in its adoption. Actually there is definitely variation

in the responses of the learners towards technology Moore (2012) categorized the learners into five categories based on their attitude towards the learning and adoption of technology given by Moore regarding the attitude of learners towards technology i.e. Innovators Early Adopters, Early Majority, Late Majority, Laggards; Skeptics. 57% of the participants fell in the category of innovators, 24% fell in early adopter, while 19% fell in early majority. This is something very encouraging and promising towards a better and successful education system in UAE.

5.2.2 Discussion on Student Responses

Research Question 1: What are the major features of blended learning?

Research Question 2: What are the significance of blended learning?

This question was corresponded by the interview question 3, 4, 5, and 6. The interviewed student described blended learning as interactive way of teaching and learning and considered it as very advantageous during the pandemic situation. According to them, it is their favorite style of learning as it is flexible enough to encompass every type of learning. They added that it is the effective way to enhance their communication skills and keeps the students positively engaged, as it contains variety of teaching techniques. Blended learning helps students to be technically advanced and it is a way of saving time. Salman (2002) mentioning the importance of blended learning mentioned that online learning is a new practice, thus very interesting, time saving, and more productive. But there are also numerous disadvantages of this practice. One among its main disadvantages is that it puts an end to social interaction. This necessitated the need for a special approach.

One interesting finding is that students lack interaction in a purely online environment. These results corroborate the idea of Vyogtsky (1978) , who suggested that students tend to perform better under the guidance of teacher and peers.

Research Question 4: If and how blended learning has impacted the education during the COVID-19 pandemic?

This theme was under Q3 in the interview from the student. The response by the student indicated that COVID – 19 impacted human life badly. It has left imprints on the smooth and uneven path of academics. The findings suggested that students were demotivated in a purely online setting due to the lack of interaction. This finding supports the idea of (Ausburn, 2004; Rovai, 2003).

5.2.3 Analysis of Parents Data

Research Question 1: What are the major features of blended learning?

Research Question 2: What are the significance of blended learning?

These research questions were corresponded under Q2 and Q4, in the interview from the parent. The reply by the parent declared the blended learning as the most flexible and interactive way of teaching and learning. The parent expressed their satisfaction with blended learning. Lack of family support results in learner's failure to complete their education. Majority of the parents support their children in their studies. These students perform well than the ones who don't get parental support . This is in correlation with the studies of Park and Choi (2009).

Research Question 4: If and how blended learning has impacted the education during the COVID-19 pandemic?

As per findings in question 5, blended learning has played an important role and it was the only viable option. During the pandemic, blended learning proved to be the optimal solution. This coincides with the findings of (Osguthorpe and Graham, 2003) .The study revealed that blended learning had features of improved pedagogy, easy access to knowledge, more collaboration among

learners, personal presence, cost-efficacy, and easy review of learning content are all advantages of the blended method .

5.3. Quantitative Analysis of the Survey Data

5.3.1 Discussion of Teachers' Responses

Research Question 1: What are the major features of blended learning?

Blended learning has improved the learning process of students. It has created interest and elevated the motivational level of students. Data revealed that teachers got an opportunity to use technology and were categorized into various proficiency levels. Blended learning is economical. Online classes helped them to overcome the educational loss that would have been faced if there was no option except conventional face-to-face learning. It provided easy access to students. Conventional classroom teaching helped in elevating confidence and enhancing communication skills.

The effectiveness of blended learning is impacted by several known and unknown factors that pose challenges. One of the major challenges is the way users use the required procedures, steps, and resources. One very important resource is the technology and the successful use of technology and participants' commitment towards its use is a decisive factor in making the learning successful. Users getting into difficulties with technology may result in abandoning the learning and eventual failure of the blended approach (Hofmann, 2014).

Research Question 3: How effective is blended learning in teaching and learning?

From the findings of teachers' data, it was revealed that the success rate is increased through the use of blended learning. Blended learning has eased up the tasks of learners by providing easy access to required data and information. Students can find answers and clarifications to their

queries. It was found to be user-friendly and the same was also supported by teachers. The effectiveness of blended learning is not merely confined to the internet or computers, or personal interest and ability, several other factors needed to be taken into account while analyzing the outcomes of blended learning. Attitudes towards blended learning, and management of workload also determine the effectiveness of blended learning (Morris and Lim, 2009).

The availability of numerous interesting apps and videos in the form of animations and lectures made online teaching more interesting and it also met the requirement of students. Online and face-to-face teaching and learning processes paved the way towards improvement. It also helped the management in evaluating students. Furthermore, teachers also agreed that online teaching has improved the learning process and students have become more responsible. They also agreed that students could easily assimilate lessons and it also increased their motivational level. It also provided a comfortable and conducive environment for learning. Face-to-face learning has improved their confidence level online teaching has made them learn. Students performance have also experienced better performance.

There was a major part in study under literature about the attitude of teachers towards the acceptance of technology. The reason for asking this question exclusively from teachers is that students usually look for new trends in learning and adopt eagerly as at that stage of life these inventions attract the much and they can easily learn it. This was the main question in the survey from teachers to check at what stage do they fall in the use of technology. This questions in the survey meant to know the participants opinion about the use of technology in education, its advantages, disadvantages, and the challenges in its adoption. There is definitely variation in the responses of the teachers towards technology. Moore (2012) categorized the learners into five categories based on their attitude towards the learning and adoption of technology given by Moore

regarding the attitude of teachers towards technology i.e. Innovators Early Adopters, Early Majority, Late Majority, Laggards; Skeptics. 57% of the participants fell in the category of innovators, 24% fell in early adopter, while 19% fell in early majority. This is something very encouraging and promising towards a better and successful education system in UAE.

Education has been assisted and improved through the use of technology, though there are also some negative impacts of technology. But the learners should be taught not only the use of technology, rather the correct and proper use of it. It is thus time for every country to introduce a more technologically equipped education sector in the future (Raja and Nagasubramani, 2018).

Research Question 4: If and how blended learning has impacted the education during the COVID-19 pandemic? (Role of Blended Learning during COVID-19)

COVID -19 has badly affected the education system. Teaching and learning in a conventional way was not possible due to the pandemic. Educational institutions remained closed and the process of teaching and learning completely came to a halt. The only way out was to adopt online teaching method and it was adopted in all over the world. Use of internet, videos, podcast and other means of virtual learning helped in resuming the teaching process to some extent and it was widely used in maximum institutions. Blended learning has proved fruitful as it has made the social distancing possible when there was utter need of it during the pandemic situation.

The responses were actually mixed expressions about the advantages and disadvantages of both conventional and digital learning. Thus, there was definitely an indirect suggestion for blended learning. As stated by the participants, blended learning is one of the modern methods of learning helping in solving the knowledge explosion problem, the growing demand for education and the problem of overcrowded lectures if used in distance learning, expanding the acceptance opportunities in education, being able to train, educate guidance and suggestions.

5.3.2 Discussion on Student Responses

Research Question 1: What are the major features of blended learning?

This major question of the study was divided into two different questions in the survey from students under Q5 and Q6.

Q5. According to your opinion, please identify the advantages for using blended learning as a teaching method.

Q6. What is the most effective aspect of blended learning?

Students described blended learning as Interactive way of teaching and learning and considered it as very advantageous during the pandemic situation. According to them, it is their favorite style of learning as it is flexible enough to encompass every type of learning. They added that it is the effective way to enhance their communication skills and keeps the students positively engaged, as it contains variety of teaching techniques. Blended learning helps students to be technically advanced and it is a way of saving time. Salman (2002) mentioning the importance of blended learning mentioned that online learning is a new practice, thus very interesting, time saving, and more productive. But there are also numerous disadvantages of this practice. As it is more interesting especially for the youngsters, they spend One among its main disadvantages is that it puts an end to social interaction. This necessitated the need for a special approach. The mid way between the conventional face to face and online learning results in a new teaching and learning approach, the so-called hybrid or blended learning (Rogers, 2001).

The responses provide ultimate flexibility in presenting content. Complex topics can be presented in the classroom, while other subject matter can be available online.

Research Question 3: How effective is blended learning in teaching and learning?

As per Q4, the data collected revealed that blended learning provides flexibility to cope with the assigned tasks at any place or time. Majority of the students learn their lessons while sitting at home through virtual learning which is easily accessible and helps them in clarification of theory. It was the only available option course that fits into the timetable of maximum students. Blended learning is economical as it does not literary require large infrastructure. Following main features were mentioned by respondents. The responses appreciated blended learning for its features like flexibility, making the learners responsible, economical, and motivation the students by allowing them to switch into either of the mode depending on their mood.

Research Question 4: If and how blended learning has impacted the education during the COVID-19 pandemic?

The findings support the idea that students need to have interaction and motivation during their lessons. Findings revealed that they feel more confident and are able to enhance their communication skills in a blended learning setting. Learners expressed that blended learning environment supports in enhancing the 21st century skills such as communication, critical-thinking, collaboration and creativity.

5.3.3 Analysis of Parents Data

Research Question 1: What are the major features of blended learning?

As per Q4, major characteristics of blended learning mentioned by parents depicted that it provides flexible teaching and learning environment. It is the approach that is more flexible, allowing independent learning, an ongoing learning approach, and safe even during the pandemic situation.

Research Question 3: How effective is blended learning in teaching and learning?

Majority of the parents agreed that blended learning had a positive impact in teaching and learning. They preferred blended learning over purely distant education. They also agreed that students tend to perform well. They get proper feedbacks during the face to face to face session which enhanced the performance.

As highlighted by Epstein and Sheldon (2016) educational programs should be viewed as an extension of the family, with collaborative activities designed to promote parent-school interactions. Therefore, parents involvement is significant.

Research Question 4: If and how blended learning has impacted the education during the COVID-19 pandemic?

Findings revealed that in the beginning of the pandemic and with the implementation of blended learning system parents were worried about the safety of their children. However, as time advanced parents found that their wards perform well in academics with the concept of blended learning.

5.4 Conclusion

This study was about the effectiveness of blended learning in teaching and learning, particularly during COVID-19. But for in depth study and through understanding of the concept “blended”.

There are three generally agreed upon reasons for designing blended courses: 1) improved learning outcomes (e.g. through alternate pedagogical approaches) 2) increase access (space and time independence) and, 3) reduce costs.

Following research questions assisted the researcher in carrying out the study:

RQ1: What are the major features of blended learning?

RQ2: What is the significance of blended learning?

RQ3: How effective is blended learning in teaching and learning?

RQ4: If and how blended learning has impacted the education during the COVID-19 pandemic?

Latest and relevant literature was reviewed thoroughly that provided an insight about blended learning and helped in smooth conduction of the research. Rapport was built with the research sample after selection. The major research tools were interviews and surveys. There were total of 69 participants in the survey and 3 for the interview. Only 3 participants didn't respond to the survey questions.

The literature and the findings favored blended learning for its various advantages. None of the participants talked against this approach of learning. However, teachers expressed some of the challenges related to online teaching and adoption of technology. Effective trainings must be given to teachers and learners to gain in depth knowledge about education technology to get maximum benefits from it in teaching and learning, thus maximizing the success rate.

5.5. Limitations of the Study

There were some limitations to the study. This study was conducted in a private school in UAE. The sample size selected for quantitative analysis was 69 including teachers, parents, and students. As a result of the small sample size, generalizability cannot be applied to the findings. The time frame was also a major challenge during the data collection. As the research was carried out during the pandemic some of the respondents could not take part in the study as they were infected. Some

of the interviews were delayed due to technical reasons and the interview was rescheduled to a different date. Data collection was a tedious process as it was carried out during the pandemic.

5.6. Implications

The findings revealed that there is no permanent and perfect replace of face to face learning. Students prefer face to face learning for many of its advantages like interaction with peers, learning from observation, sharing of knowledge, small inspirational acts from the teachers and from colleagues like helping one another, learning about team work, learning and inculcating leadership qualities etc. there is least probability of these human attributes learning online. Nevertheless, online learning has its own value and significance. It enables the teachers and the learners to learn about technology and make their duties easier and quicker. The below mentioned recommendations can be considered in future.

1. Give proper training to instructors and learners.
2. Carefully categorize the academic tasks into online and face to face. This to be so done in order to make the learners ready for any future challenge like the current COVID-19 pandemic.
3. There is need of research and measures to be taken to keep the learners safe from the negative impacts of technology.
4. Teachers and students must be educated to dispel the myth that blended learning is less effective than traditional instruction.
5. Digital well being of both students and teachers should be considered and appropriate measures should be taken.

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Appendices

Appendix I

Survey Questions-Teachers

S. No	Question
1	<i>Does blended learning allow students to learn through their own pace?</i>
2	<i>Does blended learning using a range of teaching methods?</i>
3	<i>It is about using computer platform to manage student's learning?</i>
4	<i>Is it more economical measure of teaching?</i>
5	<i>Is there any dedicated teaching and learning website developed by your faculty/ school/ department</i>
6	<i>Does blended learning make students autonomous?</i>
7	<i>How effective is online teaching?</i>
8	<i>How effective is face to face session?</i>
9	<i>In technology adoption, under which category do you fall into</i>

Appendix II

Survey Questions from Students

S. No	Question
1	<i>Did you have knowledge or experience of using blended learning prior to attending this course/ module?</i>
2	<i>Q1Q2. Do you think you have sufficient training and guidance in the use of blended learning methods?</i>
3	<i>Q3. Is the blended learning teaching method sufficiently explained in a module handbook?</i>
4	<i>Q4. Does a module handbook provide sufficient resources for this specific blended learning?</i>
5	<i>Q5. According to your opinion, please identify the advantages for using blended learning as a teaching method.</i>
6	<i>Q6. What is the most effective aspect of blended learning?</i>
7	<i>Q7. What is the least effective aspect of the use of blended learning as a teaching method?</i>
8	<i>Q8. What suggestions you can provide to help strengthen blended learning module?</i>

Appendix III

Survey Questions from Parents

S. No	Question
1	<i>Does blended learning allow students to learn through their own pace?</i>
2	<i>Does it mean using a range of teaching methods?</i>
3	<i>Is blended learning about using computer platform to manage students' learning</i>
4	<i>Q4. Do you think there are other characteristics of blended learning? If so please specify.</i>
5	<i>Q5. Has blended learning been very effective for your child?</i>
6	<i>Q6. Do your child has other needs in terms of dealing with web technology? If so please specify.</i>
7	<i>Does your child enjoy going to school each day?</i>
8	<i>Do teachers have a process to ensure the concepts are retaught in a new way or utilize a different approach to learning, when students struggle with learning?</i>
9	<i>Is there any teacher, counselor, or other staff members to whom a student can approach for help with a school problem?</i>
10	<i>Does blended learning environment at school is stimulating and leading to holistic development of child?</i>
11	<i>Are the school's learning standards and expectations clearly explained to students?</i>
12	<i>Do teachers give timely feedback about students' work?</i>
13	<i>Do teachers and other school staff communicate effectively with you as a parent?</i>
14	<i>Do you receive sufficient information about meetings, activities and opportunities for participation at this school?</i>
15	<i>In comparison to the traditional class room teaching, how would you describe the quality of interaction between students and teachers during COVID-19?</i>
16	<i>Do you feel that you are a full partner in the education of your child and have input into the decisions that affect your child?</i>
17	<i>Blended learning been very effective for your child?</i>

18	<i>Are you satisfied with the quality of education that your child is receiving during blended learning?</i>
19	<i>Do you receive sufficient information about meetings, activities and opportunities for participation at this school?</i>
20	<i>Remarks/ Suggestions on Parent School Partnership if any.</i>

Appendix IV

Transcription of Teacher's Qualitative Data

Question	Response
Q.1. Are you familiar with the term 'blended learning'?	Yes
Q. 2. How do you define blended learning?	Well, it is a mode of instruction that combines traditional and online classes.
Q. 3. Are you comfortable using blended mode of teaching?	Yes
Q.4. How effective is blended learning in teaching during the COVID 19 situation?	Well, blended learning has got lots of positive impact in the area of teaching. Purely distant (e learning) education has reduced interaction with peers as well as the teacher. During the start of COVID 19 when we switched to the online learning we found that engagement levels and motivation levels going down. In the area of assessment, it was really difficult to assess the child completely online. I feel that blended learning is flexible as well. With blended learning I believe that students are more focused and it is possible to incorporate active learning .It also helps in improving the 21 st century skills. Giving feedbacks face to face is more effective than in a virtual environment.
Q.5. Do you find the students motivated in a blended learning environment?	Yes, students stay focused and are engaged in the activities than in a purely distant classroom environment.

Q.6. Do you think the collaboration between students in this environment is more? If yes, please explain? How do you implement group activities as per the COVID protocols?	Well, it has been noticed that the students tend to work better in groups in a blended learning environment. They actively participate in the activities assigned. All the group activities are assigned as per the COVID protocols. Learners' safety is our prime motto. It is ensured that there is no physical contact between the students.
Q.7. How do you think blended learning in COVID 19 has affected in terms of technology adoption? In the technology adoption cycle -Innovators, early adopters, early majority, early minority and laggards which category do you fall into?	Well, as a boon I think that blended learning have helped many teachers in technology adoption. I have learnt many apps which I didn't know before which is indeed a great thing. I think I am an early adopter.
Q.8. Which apps do you find effective in implementing blended learning?	I have been using Nearpod , Padlet , CClasskick, Mentimeter. I find all these apps help me to assess and give feedback instantly and it keeps the engagement levels high.
Q.9. What challenges do you face as part of blended learning in the COVID 19 situation?	Well, designing an effective lesson is a challenge. To effectively plan and design the lessons for the online and face to face classes is a real challenge .Teachers work more to design the lessons. Also, In the COVID 19 situation, if a student or teacher tests positive it brings a lot of fear in others.
Q.10. Do you have any suggestions?	Yes. I would recommend that teachers should be given proper training for designing the course.

Appendix V

Transcription of student's Qualitative Data

Question	Responses
Q. 1. Are you familiar with the term blended learning?	Yes
Q. 2. In your words, define blended learning?	Well. It's a mix of face to face and online classes
Q. 3. Has blended learning helped in your studies during the COVID 19 situation? .	Absolutely. I was really bored with the system of complete e-learning system. However, with blended learning I am able to focus on my studies. I am happy that I am able to come to school and meet my friends
Q. 4. Do you enjoy blended learning? Why?	Yes, I do. I find it more flexible.
Q. 5. Do you think that blended learning has / has not given you the chance for proper feedback and assessments?	Well I agree that blended learning has given me chances to interact with my friends and teachers. I find that my teacher's feedback is more effective in blended learning. As in assessments, I feel that we students prepare more and take it seriously in blended learning.
Q. 6. What other factors do you like about blended learning?	Well. I feel that I stay motivated and engaged more in a blended learning environment.
Q. 7. Do you think group work is more effective in a blended learning? IF yes, Why?	Yes. I like group works and I am able to work more efficiently in a group. We discuss and share ideas in a group.
Q. 8. What are the challenges you face?	When in online session of blended learning I find network connectivity is a challenge.

Appendix VI

Transcription of Parent's Qualitative Data

Question	Response
Are you familiar with blended learning?	Yes. It's a blend of traditional and e learning classes.
Q.2. DO you think your ward is enjoying blended learning?	Yes. I find my child more engaged in this type of learning environment
Q. 3. What do you think are the advantages of blended learning in the COVID-19 situation?	I feel that my child is connected to the school. Hence to a certain extent my child enjoys the presence of teachers and friends
Q.4. Do you think feedback and assessment during blended learning is effective?	Yes I think that teachers give instant feedback. Also I find my child preparing more for the assessments than in an e learning environment.
Q.5. What difficulties do you face in this type of learning?	When some students get positive, as a parent I get the fear if my kid is infected. I am worried about the safety. Other than that I don't find any difficulty.

Respondent	Text	Theme	Code
Teacher	Well, it is a mode of instruction that combines traditional and online classes.	Blended learning	Definition
	Well, blended learning has got lots of positive impact in the area of teaching. Purely distant (e learning) education has reduced interaction with peers as well as the teacher. I feel that blended learning is flexible as well. With blended learning I believe that students are more focussed and it is possible to incorporate active learning .It also helps in improving the 21 st century skills. Giving feedbacks face to face is more effective than in a virtual environment.	Advantages of blended Learning	Flexibility
	Yes, students stay focussed and are engaged in the activities than in a purely distant classroom environment.	Advantages Of blended learning	Motivation
	Well, as a boon I think that blended learning have helped many teachers in technology adoption. I have learnt many apps which I didn't know before which is indeed a great thing. I think I am an early adopter.	Advantages of blended learning	Technology Adoption
	I have been using Nearpod , Padlet , CLasskick, Mentimeter. I find all these apps help me to assess and give feedback instantly and it keeps the engagement levels high.	Advantages of blended learning	Technology Adoption
	Well, it has been noticed that the students tend to work better in groups in a blended learning environment. They actively participate in the activities assigned. All the group activities are assigned as per the COVID protocols. Learners' safety is our prime motto. It is ensured that there is no physical contact between the students.	Advantages Of blended learning	Collaboration
	During the start of COVID 19 when we switched to the online learning we found that engagement levels and motivation levels going down. In the area of assessment, it was really difficult to assess the child completely online.	Role of Blended Learning during COVID_19	COVID_19 and Blended learning

	Well, designing an effective lesson is a challenge. To effectively plan and design the lessons for the online and face to face classes is a real challenge .Teachers work more to design the lessons.	Impact of COVID-19 on teaching and learning	Challenges
	Also, in the COVID 19 situation, if a student or teacher tests positive it brings a lot of fear in others. Yes. I would recommend that teachers should be given proper training for designing the course.	Education Technology	Training
Student	Well. It's a mix of face to face and online classes	Blended learning	Definition
	Absolutely. I was really bored with the system of complete e-learning system. However, with blended learning I am able to focus on my studies. I am happy that I am able to come to school and meet my friends.	Advantages of blended learning	Collaboration
	Yes, I do enjoy blended learning as I find it more flexible.	Advantage of blended learning	Motivation
	Well I agree that blended learning has given me chances to interact with my friends and teachers. I find that my teachers' feedback is more effective in blended learning. As in assessments, I feel that we students prepare more and take it seriously in blended learning.	Advantage of blended learning	
	Well. I feel that I stay motivated and engaged more in a blended learning environment. Yes. I like group works and I am able to work more efficiently in a group. We discuss and share ideas in a group.	Advantage of blended learning	Collaboration
	When in online session of blended learning I find network connectivity is a challenge.	Disadvantage of blended learning	Challenges
Parent	Yes. I feel it's a blend of traditional and e learning classes.	Blended learning	Definition
	I feel that my child is connected to the school. Hence to a certain extent my child enjoys the presence of teachers and friends.	Education technology	Technology
	Yes. I find my child more engaged in this type of learning environment	Effectiveness of blended learning	Motivation
	Yes I think that teachers give instant feedback. Also I find my child preparing more for the assessments than in an e learning environment.	Effectiveness of blended learning	effectiveness

	<p>When some students get positive, as a parent I get the fear if my kid is infected. I am worried about the safety.</p> <p>Other than that I don't find any.</p>	<p>COVID_19 and education</p>	<p>Challenge</p>
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APPENDIX VII -TEACHERS CONSENT FORM

TEACHER'S SURVEY

Dear participant,

You are invited to take part in a research study. It is important you understand the reason for the research. Please take time to read the following information carefully. I am available to clarify any questions you may have.

THE PURPOSE

This research is part of a Masters Dissertation at The British University in Dubai. This research aims to explore the impact of blended learning in teaching and learning during the Covid 19 pandemic.

Do I have to complete the questionnaire?

Participation in this questionnaire is entirely voluntary. Your decision to complete this questionnaire will not affect your personal or professional life in any way. I would personally, however, be grateful for your time. You have the right to withdraw from it anytime.

What will happen if I agree?

The questionnaire will involve reflecting upon your own experience. You will be asked to respond to questions. It is expected this survey shall take no more than 10 minutes. You will not provide any personal information.

Your name and email address will remain anonymous and your responses are confidential.

What will happen to the results of the research study?

The results will be analysed by the researcher, Fathima Nisana. The results and findings will be viewed by the researcher and the University advisor. The data collected will be stored securely and in accordance with the Data Protection Act and GDPR (2018).

Who may I contact for further information?

Fathima Nisana

nisana.fathima@gmail.com

Consent to participate - PLEASE CHECK BOX below!

* Required

APPENDIX VIII -STUDENTS CONSENT FORM

STUDENT'S SURVEY

Dear participant,

You are invited to take part in a research study. It is important you understand the reason for the research. Please take time to read the following information carefully. I am available to clarify any questions you may have.

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Who may I contact for further information?

Fathima Nisana

nisana.fathima@gmail.com

Consent to participate - PLEASE CHECK BOX below!

* Required

APPENDIX IX -PARENT SURVEY FORM

PARENT SURVEY

Dear participant,

You are invited to take part in a research study. It is important you understand the reason for the research. Please take time to read the following information carefully. I am available to clarify any questions you may have.

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Your name and email address will remain anonymous and your responses are confidential.

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Fathima Nisana

nisana.fathima@gmail.com

Consent to participate - PLEASE CHECK BOX below!