

**Technology Integration in Higher Educational Institutions  
in the UAE: Evaluating the Usability and Suitability of  
Blackboard Learn with the Perspectives of the Faculty  
Members**

دمج التكنولوجيا في مؤسسات التعليم العالي في الإمارات: تقييم قابلية استخدام و  
ملاءمة أداة بلاك بورد للتعليم عن بعد من وجهة نظر أعضاء هيئة التدريس

by

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**A thesis submitted in fulfilment  
of the requirements for the degree of  
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## **ABSTRACT**

This study is aimed at providing insights into the main prospects, obstacles and best practices of technology integration for the effective implementation of a smart remote learning system in the United Arab Emirates (UAE). Such insights are obtained through examining the usability and suitability of Blackboard Learn (BBL) among faculty members of the biggest and second oldest higher education institution in the UAE. The main research question is – ‘what are the trends and developments accounted for in the literature on technology integration in higher educational institutions in the UAE?’ Two main groups of theories were consulted in this study. Broad theories such as Scaffolding, Zone of Proximal Development ZPD and Activity Theory and specific theories like TPACK, Bloom's digital taxonomy, and Connectivism Learning Theory are referred to in order to draw suitable conclusions.

The rationale of this study is to discuss the data gathered to improve the faculty's professional experiences of technology integration. The rationale can also be explained by examining the progress of implementation of BBL in the UAE. Technology integration is a critical aspect of the educational industry as per the guidelines given by the governments to achieve the goals of the National Agenda of the UAE Vision 2021 to transform the UAE into a smart country. Therefore, examining the progress of such integration is significant.

A mixed methods research was conducted on Emirati higher education institutions. Quantitative data was gathered through electronically distributed surveys with 329 faculty members. On the other hand, qualitative data was collected through electronically distributed questionnaires among 14 faculty members. The software used for quantitative data analysis is SPSS. On the other hand, the analysis technique used for the qualitative data involved coding the data and categorizing them into themes.

The key findings of the study were that technology integration is beneficial and the BBL is a suitable tool to be used in higher education. It was integrated into the teaching practices by the faculty members to a great extent during the quarantine period (COVID-19). Some external factors such as connectivity proved to be a major challenge to the faculty's daily teaching practices.

Faculty members witnessed some obstacles whilst using BBL such as lack of student's readiness, lack of faculty readiness, and connectivity issues.

The implications of the study were the following – the faculty member's contributions, the technical skills and the training for both faculty members and students in higher education as well as their motivation and readiness are essential in order to ensure effective utilization of BBL. The limitation of the study included the lack of the student's perspective, the failure of some faculty member to give a detailed response, and the consideration of one higher education institution rather than including several different institutions. This study claims that regardless of the data analysis, there were some challenges and improvement areas to be considered for the effective implementation of BBL. Scope of further study can be an investigation of the impact of COVID-19 on technology integration.

## نبذة مختصرة

تهدف هذه الدراسة لفهم الآفاق والعقبات الرئيسية وأفضل الممارسات لدمج التكنولوجيا في التعليم العالي لإعتماد وتنفيذ نظام التعلم عن بعد الذكي في دولة الإمارات العربية المتحدة ، من خلال دراسة قابلية استخدام التكنولوجيا و ملائمة أداة بلاك بورد من وجهة نظر أعضاء هيئة التدريس في التعليم العالي. سؤال البحث الرئيسي هو "ماهي التطورات و الإتجاهات الواردة لأداة بلاك بورد ليرن في التربية والتي تختص بدمج التكنولوجيا في مؤسسات التعليم العالي في دولة الإمارات؟". تم الإستشهاد بفئتين رئيسيتين من النظريات في هذه الدراسة على النحو التالي , نظريات رقمية متخصصة بالتكنولوجيا و نظريات تربوية عامة مثل: النظريات (Digital Bloom's Taxonomy, TPACK and Connectivism) النظريات المتخصصة بالتكنولوجيا هي (Scaffolding, Zone of Proximal development and Activity Theory) العامة هي

الفكرة الأساسية في هذه الدراسة هي مناقشة البيانات التي تم جمعها لتحسين تجارب التعلم الذكي في التعليم العالي في دولة الإمارات بالإضافة إلى دراسة تنفيذ و تطوير أداة بلاك بورد ليرن (BBL) في الإمارات وإضافة آخر المستجدات في هذا السياق. علاوة على ذلك ، يود هذا البحث أخذ الإرشادات التي قدمها أعضاء هيئة التدريس بعين الاعتبار لتحقيق أهداف الأجندة الوطنية لرؤية الإمارات 2021 و تحويل التعلم في دولة الإمارات إلى تعلم ذكي.

تم إجراء بحث كمي و نوعي في مؤسسة تعليم عالي إماراتية ذات 14 فرع مختلف حول الإمارات. تم جمع البيانات الكمية من خلال المسح الموزع إلكترونياً لأعضاء هيئة التدريس و الذين يبلغ عددهم الإجمالي 329. و تم جمع البيانات النوعية من خلال الاستبيان الموزع إلكترونياً على 14 عضو هيئة تدريس من 14 فرع مختلف للمؤسسة التعليمية ذاتها . تم تحليل البيانات الكمية بشكل مقداري عبر برنامج SPSS. بينما تم تحليل البيانات النوعية بشكل سردي حسب الأفكار و الفئات المتشابهة للبيانات.

تفيد النتائج الرئيسية حسب إفادة أعضاء هيئة التدريس أن دمج التكنولوجيا مفيد وأن أداة (BBL) تعتبر أداة مناسبة للاستخدام في مرحلة التعليم العالي. حيث تم استخدام مميزات (BBL) في ممارسات التدريس بالكلية إلى حد كبير خلال فترة الحجر الصحي (COVID-19). شكلت بعض العوامل الخارجية تحديات في الممارسات اليومية على المستوى التقني و مشاكل الاتصال بالانترنت. كما شهد أعضاء هيئة التدريس بعض العقبات أثناء استخدام أداة (BBL) مثل قلة استعداد بعض الطلاب للتعلم عن بعد، و قلة استعداد بعض أعضاء هيئة التدريس ، وقلة الخبرة في استخدام التكنولوجيا.

أضافت نتائج البحث على مساهمات أعضاء هيئة التدريس السابقة في التعليم العالي و شجعت على استعداد كل من أعضاء هيئة التدريس والطلاب. كانت الدراسة نوعاً ما محدودة حيث أنها تقتصر إلى صوت الطالب. بالإضافة إلى أن بعض أعضاء هيئة التدريس لم يقدموا رداً مفصلاً عن تجاربهم. تم تضمين مؤسسة تعليم عالي واحدة ذات أفرع كثيرة بدلاً من تضمين مؤسسات تعليم عالي مختلفة. في المستقبل يمكن أن يكون نطاق الدراسة أكبر و تبني دراسة جديدة على تأثير COVID-19 في دمج التكنولوجيا في التعليم. تزعّم هذه الدراسة أنه بغض النظر عن تحليل بيانات المشاركين في البحث ، فقد تم الكشف عن وجود بعض التحديات و نقاط للتحسين التي يجب أخذها في الاعتبار في هذه الدراسة.

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## Contents

|  |    |
|--|----|
| <b>CHAPTER ONE: INTRODUCTION</b>                                     | 1  |
| 1.1 Outline of the Chapter   | 1  |
| 1.2 Background to the Study  | 1  |
| 1.2.1 United Arab Emirates   | 2  |
| 1.2.2 History of Higher Education in the United Arab Emirates        | 4  |
| 1.2.3 Blackboard Learn (BBL)   | 5  |
| 1.3 Problem Statement  | 7  |
| 1.4 Purpose and Objectives   | 9  |
| 1.5 Research Questions   | 10 |
| 1.6 Rationale to the Study   | 11 |
| 1.7 Structure of the Dissertation                                    | 13 |
| <b>CHAPTER TWO: LITERATURE REVIEW</b>                                | 14 |
| 2.1 Overview of the Chapter  | 14 |
| 2.2 Conceptual Analysis  | 16 |
| 2.2.1 Research Keywords  | 16 |
| 2.2.2 Technology Integration in the Higher Education                 | 18 |
| 2.2.3 Faculty's Doubts of Technology Integration in Higher Education | 19 |
| 2.2.4 Remote Learning in the Higher Education                        | 20 |
| 2.2.5 The Pandemic of Coronavirus (COVID-19) and Education           | 24 |
| 2.3 Theoretical Framework  | 26 |
| 2.3.1 Theoretical Framework Outline                                  | 26 |
| 2.3.2 Specific Review of Learning Theories                           | 28 |
| 2.3.3 Broad Review of Learning Theories                              | 48 |
| 2.4 Theoretical Standpoint   | 56 |
| 2.5 BBL as an Emerging Platform in Higher Education                  | 59 |
| 2.5.1 Description of BBL   | 59 |
| 2.5.2 Role of BBL in Teaching [Faculty]                              | 63 |
| 2.5.3 Role of BBL in Learning [Students]                             | 65 |
| 2.5.4 BBL and Remote Education                                       | 67 |
| 2.5.5 History of BBL in Higher Education                             | 69 |
| 2.5.6 Perceptions of BBL and Experiences around the World            | 71 |
| 2.5.7 Professional Views towards the Use of BBL                      | 73 |
| 2.5.8 Role of BBL in Teaching and Learning                           | 74 |
| 2.5.9 Future of BBL in Higher Education                              | 76 |
| 2.6 Review of the Related Literature                                 | 78 |
| 2.6.1 Technology Integration   | 78 |



|  |     |
|--|-----|
| 2.6.2 The Utilization of BBL .....   | 82  |
| 2.6.3 More Related Studies .....   | 86  |
| 2.7 Other Digital Tools Used in Higher Education .....                             | 89  |
| 2.8 Summary .....  | 90  |
| <b>CHAPTER THREE: METHODOLOGY</b> .....  | 94  |
| 3.1 Overview of the Chapter .....  | 94  |
| 3.2 Research Approach .....  | 94  |
| 3.3 Data Collection Plan.....  | 96  |
| 3.3.1 Mixed Methods Design.....  | 97  |
| 3.3.2 Current Research Questions.....  | 103 |
| 3.3.3 Site Investigated.....   | 106 |
| 3.3.4 Samples and Sampling Techniques Used.....                                    | 107 |
| 3.3.5 Quantitative Design Participants - Survey .....                              | 108 |
| 3.3.6 Qualitative Design Participants - Questionnaire .....                        | 108 |
| 3.3.7 Procedure of the Study .....   | 109 |
| 3.3.8 Questionnaire Participants .....   | 113 |
| 3.4 Instruments of the Study .....   | 114 |
| 3.4.1 Survey – Quantitative Design .....   | 114 |
| 3.4.2 Questionnaire – Qualitative Design .....                                     | 119 |
| 3.4.3 Reliability.....   | 121 |
| 3.4.4 Design of Revised Technology Integration (TI) Survey and Questionnaire ..... | 122 |
| 3.4.5 Validity .....   | 123 |
| 3.5 Data Analysis Plan .....   | 147 |
| 3.5.1 Quantitative Data Analysis .....   | 147 |
| 3.5.2 Qualitative Data Analysis .....  | 148 |
| 3.6 Delimitations of the Study.....  | 148 |
| 3.7 Ethical Consideration .....  | 149 |
| 3.7.1 Principles of Ethical Considerations .....                                   | 149 |
| 3.7.2 Role of the Researcher .....   | 151 |
| 3.8 Trustworthiness, Site, Samples .....   | 152 |
| 3.9 Summary .....  | 153 |
| <b>CHAPTER FOUR: REULTS, ANALYSIS AND DISCUSSION</b> .....                         | 154 |
| 4.1 Overview of the Chapter .....  | 154 |
| 4.2 Analysis of Quantitative Data .....  | 154 |
| 4.2.1 Data Screening .....   | 155 |
| 4.2.2 Demographic Details Analysis – Quantitative Design.....                      | 157 |
| 4.2.3 Descriptive Statistics.....  | 159 |

|   |     |
|---|-----|
| 4.2.4 Correlational Analysis .....  | 172 |
| 4.2.5 One sample t-tests .....  | 174 |
| 4.2.6 Analyses of Variance .....  | 175 |
| 4.3 The Quantitative Results .....  | 178 |
| 4.3.1 Summary of Quantitative Results .....   | 181 |
| 4.4 Analysis of Qualitative Data .....  | 184 |
| 4.4.1 Participants of the Qualitative Study.....                                    | 185 |
| 4.5 Summary of the Qualitative Results .....  | 198 |
| 4.6 Triangulation of Quantitative and Qualitative Data .....                        | 200 |
| <b>CHAPTER FIVE: CONCLUSION</b> .....   | 202 |
| 5.1 Overview of the Chapter .....   | 202 |
| 5.2 Summary of the Study .....  | 202 |
| 5.3 Key Findings .....  | 203 |
| 5.3.1 Technology Integration and the Suitability of BBL in Higher Education.....    | 204 |
| 5.3.2 The Trends and Developments on Technology Integration and BBL in the UAE..... | 205 |
| 5.3.3 Integrating Technology and the Use of BBL .....                               | 207 |
| 5.3.4 Faculty's Experiences and Perspectives within BBL.....                        | 208 |
| 5.4 Implications.....   | 209 |
| 5.4.1 Faculty's Contributions.....  | 209 |
| 5.4.2 Technical Skills and Training .....   | 210 |
| 5.4.3 Motivation and Readiness .....  | 210 |
| 5.5 Recommendations .....   | 211 |
| 5.6 Strengths and Limitations.....  | 212 |
| 5.6.1 Strengths of the Study .....  | 213 |
| 5.6.2 Limitations of the Study.....   | 213 |
| 5.7 Scope for Further Study .....   | 214 |
| 5.8 Concluding Note .....   | 215 |
| <b>REFERENCES</b> .....   | 217 |
| <b>APPENDICES</b> .....   | 234 |

## List of Figures

|   |     |
|---|-----|
| <b>Figure 1;</b> the overview of the literature review.....                                     | 28  |
| <b>Figure 2;</b> Conceptual Analysis key themes.....  | 29  |
| <b>Figure 3;</b> Theoretical framework outline.....   | 41  |
| <b>Figure 4;</b> TPACK Theory Model.....  | 42  |
| <b>Figure 5;</b> the first version of Bloom's Taxonomy map by Churches 2007.....                | 46  |
| <b>Figure 6;</b> Nouns of Bloom's Taxonomy by Churches 2007.....                                | 48  |
| <b>Figure 7;</b> Bloom's Revised Taxonomy .....   | 49  |
| <b>Figure 8;</b> Bloom's Digital Taxonomy verbs.....  | 51  |
| <b>Figure 9;</b> Connectivism Learning Theory.....  | 59  |
| <b>Figure 10;</b> the tools used in the activity theory (AT) by Coleman and Coleman (2013)..... | 62  |
| <b>Figure 11;</b> Sequential Explanatory Mixed Methods design.....                              | 110 |
| <b>Figure 12;</b> the process of the data collection in this present study.....                 | 113 |
| <b>Figure 13;</b> the process followed in the qualitative method.....                           | 114 |
| <b>Figure 14;</b> Scree plot.....   | 143 |

## List of Tables

|   |             |
|---|-------------|
| <b>Table 1:</b> assertiveness of Quantitative research.....                         | 112         |
| <b>Table 2:</b> Conceptual Analysis key themes .....                                | 116         |
| <b>Table 3:</b> Participant's sites.....  | 121         |
| <b>Table 4:</b> Gender details of the research.....                                 | 122         |
| <b>Table 5:</b> Participant's experiences.....                                      | 123         |
| <b>Table 6:</b> statistics of teaching experience.....                              | 124         |
| <b>Table 8:</b> reliability of BBL scales.....                                      | 134         |
| <b>Table 9:</b> Correlation Matrix.....   | 137         |
| <b>Table 10:</b> KMO and Bartlett's Test.....                                       | 138         |
| <b>Table 11:</b> Communalities values.....  | 140-141     |
| <b>Table 12:</b> Total variance explained.....                                      | 142         |
| <b>Table 13:</b> The correlation between variables.....                             | 143         |
| <b>Table 14:</b> 1 <sup>st</sup> coefficients and VIF values.....                   | 145         |
| <b>Table 15:</b> 2 <sup>nd</sup> coefficients and VIF values.....                   | 145         |
| <b>Table 16:</b> 3 <sup>rd</sup> the coefficients and VIF values.....               | 146         |
| <b>Table 17:</b> Component factors.....   | 146-147-148 |
| <b>Table 18:</b> Rotated Component Matrix.....                                      | 149-150-151 |
| <b>Table 19:</b> Pattern Matrix.....  | 152-153     |
| <b>Table 20:</b> Component Correlation Matrix.....                                  | 154         |
| <b>Table 21:</b> Descriptive Statistics.....  | 155-157     |
| <b>Table 22:</b> the process of pilot study and intended study.....                 | 159         |
| <b>Table 23:</b> the first question in the demographic questions of the survey..... | 170         |
| <b>Table 24:</b> the second question in the demographic questions.....              | 171         |
| <b>Table 25:</b> third question of demographic questions.....                       | 172         |
| <b>Table 26:</b> Frequencies of section 1 scores.....                               | 174         |
| <b>Table 27:</b> Frequency of question 10 in section 1 .....                        | 175         |
| <b>Table 28:</b> Frequency of variable 8 in section 1.....                          | 175         |
| <b>Table 29:</b> Frequency of variable 2 in section 2.....                          | 177         |
| <b>Table 30:</b> Frequency of variable 1 in section 3.....                          | 180         |
| <b>Table 31:</b> Frequency of variable 1 in section 3.....                          | 182         |

|  |         |
|--|---------|
| <b>Table 32:</b> the correlation matrix for Blackboard domains.....                              | 183     |
| <b>Table 33:</b> one-sample t-test statistics.....   | 186     |
| <b>Table 34:</b> one-sample t-test.....  | 187     |
| <b>Table 35:</b> One-way ANOVA test.....   | 188     |
| <b>Table 36:</b> the summary of cases.....   | 189     |
| <b>Table 37:</b> Participants years of experience.....   | 190     |
| <b>Table 38:</b> Descriptive statistics of research question 2.....                              | 192-193 |
| <b>Table 39:</b> Mean of research question 2.....  | 194     |
| <b>Table 40:</b> Demographic information of the questionnaire participant.....                   | 198     |
| <b>Table 41:</b> LR vs empirical study findings – Suitability of BBL.....                        | 198     |
| <b>Table 42:</b> the common themes addressed in survey, questionnaire and LR.....                | 213-214 |
| <b>Table 43:</b> LR findings vs empirical study findings – Trends and Developments.....          | 217-218 |
| <b>Table 44:</b> LR findings vs empirical study findings – BBL and technology Integration.....   | 218-219 |
| <b>Table 45:</b> LR findings vs empirical study findings – Faculty’s experiences within BBL..... | 220     |
| <b>Table 46:</b> the common themes addressed in survey, questionnaire and LR.....                | 221-222 |

## **List of Histogram**

|   |     |
|---|-----|
| <b>Histogram 1;</b> the Y and X in variable 10 section 1..... | 150 |
| <b>Histogram 2,</b> the Y and X in variable 8 section 1.....  | 152 |
| <b>Histogram 3,</b> the Y and X in variable 2 section 2.....  | 155 |
| <b>Histogram 4,</b> the Y and X in variable 1 section 3.....  | 157 |

### List of Abbreviations

| Abbreviations   | Definition                                      |
|-----------------|---|
| <b>UAE</b>      | United Arab Emirates                            |
| <b>TI</b>       | Technology integration                          |
| <b>BBL</b>      | Blackboard Learn                                |
| <b>ICT</b>      | Information, communication, and technology      |
| <b>UAEU</b>     | United Arab Emirates University                 |
| <b>ZU</b>       | Zayed University                                |
| <b>Covid-19</b> | Corona virus                                    |
| <b>MT</b>       | Microsoft Teams                                 |
| <b>KSA</b>      | The Kingdom of Saudi Arabia                     |
| <b>SA</b>       | South Africa                                    |
| <b>USA</b>      | The United States of America                    |
| <b>CU</b>       | Collaborate Ultra                               |
| <b>ZPD</b>      | Zone of proximal development                    |
| <b>CLT</b>      | Connectivism Learning theory                    |
| <b>AT</b>       | Activity Theory                                 |
| <b>BDT</b>      | Bloom's Digital Taxonomy                        |
| <b>HEI</b>      | Higher education institutions                   |
| <b>HE</b>       | Higher Education                                |
| <b>DT</b>       | Digital tool                                    |
| <b>VLE</b>      | Virtual learning environment                    |
| <b>HI</b>       | Higher Education                                |
| <b>RE</b>       | Remote Education                                |
| <b>WFH</b>      | Work From Home                                  |
| <b>TPACK</b>    | Technological Pedagogical and Content Knowledge |
| <b>PCA</b>      | Principal Component Analysis                    |
| <b>VIF</b>      | variance inflation factor                       |

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Outline of the Chapter**

The significance of education in shaping the future of individuals is indisputable. Nelson Mandela believed that education has the potential to impact the entire world and influence the future of humanity (Duncan 2020). According to Picco (2011), technology is an effective tool that needs to be equipped appropriately with the right choice of digital tools as well as it needs to be equipped with rich content. Thus, there are two key components of successful experience which are using technology in the educational field; implementing a good choice of digital tools and rich content. However, technology cannot work independently; it is incorporated for supporting the other aspects of an industry for the promotion of efficiency. The same principles are applicable to the educational industry.

The learning technology utilized by the United Arab Emirates' (UAE) largest higher education provider is Blackboard Learn (BBL). While this has been in place for several years, the recent global pandemic has meant that the use of the BBL platform became considerably more important. This thesis investigated the faculty's perception of the use of BBL as the main source of remote learning during the pandemic period (COVID-19).

In this chapter, six important points related to the research topic are highlighted. First of all, a background to the study is discussed (Section 1.2). Next, a discussion of the problem statement followed (Section 1.3), the research purposes and objectives of this study (Section 1.4), and the research questions and hypotheses (Section 1.5). The rationale for the study is then presented (Section 1.6). The final section in this chapter is the structure of this doctoral thesis (Section 1.7).

### **1.2 Background to the Study**

In recent times, the world has observed a rapid growth in the digital learning space. The use of information and communication technology (ICT) is snowballing worldwide, and the same is true



for the UAE educational industry. Hence, the UAE is stressing the importance of providing an ICT-rich learning environment (Assar 2019). To understand the context in which this study is situated, a brief history of the United Arab Emirates, (Section 1.2.1), higher education in the region to date (Section 1.2.2), and an introduction to BBL (Section 1.2.3) are presented below.

### **1.2.1 United Arab Emirates**

Abdalla (2007) published research fifteen (15) years ago wherein the BBL platform was evaluated. The study was conducted based on the student's perspectives. It took place at the United Arab Emirates University (UAEU) in Al-Ain. The final research findings based on the student's experiences suggested that BBL had a significant positive influence on the students' performance because it was user friendly.

The capacity of BBL was appropriate for accommodating the growing number of users everywhere in the world before and after the COVID-19 pandemic. In addition, as reported by Speed (2020), it was revealed that the shift of education from traditional practices to digital learning practices turned out to be complex and challenging. However, using BBL was not as challenging as compared to other online teaching and learning tools. BBL has gained extraordinary prominence and witnessed significant progress in terms of the capacity of usage. Accordingly, a significant number of users were using BBL during the coronavirus (COVID-19) period. BBL usage statistics during the first four months of 2020 skyrocketed and eventually broke all the previous records (ibid).

BBL collaborated with higher education organizations to recognize and address the needs of the stakeholders, the faculty, and the students. Speed (2020) stated that over the past several months, the BBL team worked side-by-side with the worldwide education industry. On account of the pandemic, the global education system has been compelled to transform from traditional education practices to remote learning options.

In reaction to the (COVID-19) pandemic, the United Arab Emirates (UAE) declared that the traditional ways of teaching will be postponed from the 22<sup>nd</sup> of March until further notice in all

the schools of the UAE and the higher education institutions as well as universities. The shift to distance teaching and learning affected all the government ministries as well as the private sectors. The traditional way of working was replaced with a remote working approach that is, working from home (WFH).

Approximately one million students implemented remote learning during the pandemic (UNICEF 2020). This remote learning transformation dramatically increased the use of BBL in higher education institutions. However, at schools, the remote online learning tool implemented was Microsoft Teams (MT). Due to this sudden shift, a lot of faculty and students were doubting the use of BBL as an alternative way of teaching. The faculty was not sure if BBL was suitable for achieving the daily learning and teaching objectives successfully (Speed 2020).

One of the top digital tools that were implemented widely in higher education was BBL, however, it was not used locally. BBL addressed the students and faculty necessities in this altering learning environment. According to Boshielo (2014), BBL played a huge role in developing teaching and learning practices of multiple universities across the world. Several researchers have reported that the online practices of both the faculty and the teachers have been enhanced with the implementation of BBL.

BBL enhanced the quality of traditional education compared to what it was before COVID-19 and it has the potential to provide premium quality remote learning options during quarantine periods. Aloklu (2018) emphasized that numerous studies confirmed that BBL has the potential to enhance the quality of education. Additionally, it was confirmed that this digital tool has been used during the last ten years and the number of users is still increasing (ibid).

BBL is a commonly used tool in higher education in the UAE. Draves (2002) highlighted the significance of BBL and its role in running a powerful system in the education industry. In addition to that, BBL is known as a user-friendly tool. Faculty, administrative staff, and students can use BBL easily for many purposes. Some of the uses of BBL include - educational tutoring, communicating, quizzing, interviewing, and assessment setting. Furthermore, BBL saves time and money and increases the chance of teaching online courses successfully (ibid).

### **1.2.2 History of Higher Education in the United Arab Emirates**

Ten years ago, H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the United Arab Emirates (UAE) and the Ruler of Dubai launched the vision of the United Arab Emirates for 2021. The very first goal of this vision was to improve the quality of governmental services provided to residents and citizens in the UAE, including education.

Based on the UAE Vision 2021 National Agenda, this vision was remapped in 2018 with six key priorities requiring actions and developments to transform vision into reality by 2021. First of all, the primary priority is providing the best healthcare. The second priority is offering a competitive economy. The third priority is providing the highest quality of safety and fair judgement in courts for all residents in the UAE. The fourth priority is providing a concrete society. The fifth priority, and perhaps the most significant in this research due to its relation to the current research topic, is developing a first-rate education system across the country. The last, but not the least priority was centered on providing a sustainable environment (UAE Vision 2021).

The National Agenda acknowledged that based on Vision 2021, UAE will be one of the best countries around the globe, and it will serve as a role model for other countries (AlSuwaidi 2020). The UAE Vision 2021 and the UAE government are aiming for a full transformation of the existing teaching approaches and education system. During a national meeting in the year 2010, the National Agenda stated that the primary objective of the UAE government is to ensure that all the schools and universities in the UAE be equipped with a smart education system. Therefore, all forms of education in the UAE would be based on technology either as a system ‘hardware’ or digital tool embedded ‘software’ (AlSuwaidi 2020).

As mentioned earlier, the current research topic is connected with priority number five of the UAE vision 2021 which is to develop the highest quality education system in the UAE that involves the implementation of digital technologies such as BBL. H.H. Sheikh Mohammed bin Rashid Al Maktoum believes that education is a critical element of the country. He added that providing high-quality education will be a great opportunity for youth as well as ensure a brighter future for the

country (AlSuwaidi 2020). This justified the need for investing in the enhancement of the educational system.

Education investment, therefore, is a critical investment. Psacharopoulos (1994), suggested that investment in higher education pays off since it helps youth to acquire the necessary soft skills and digital skills. Thus, the UAE government is aiming to provide major investments to endorse and reinforce the smart education system starting from the preschool stage. This is because the pre-school stage acts a major part in shaping and directing the children's future.

### **1.2.3 Blackboard Learn (BBL)**

The technology world is evolving rapidly and is getting better every single day. The number of users of technology has increased over time. In theory, digital tools require the inclusion of a new tool or an update in the existing tool that can function better to suit the learning environment changes. BBL has been used in the education systems at the higher education level in the UAE for a very long time. Thus, it is not a new technology as the very first BBL system was established twenty years ago in 2000 (Hayes-Roth et al. 1986). Thus, it needs consistent updates in order to stay in alignment with the changing learning environment.

BBL applications have been used for varied purposes. For instance, education, health science, marketing, engineering, social studies, informational technology, and other business. It is also worth noting that BBL is the first system that has been modified and improved based on the user's experiences (Hayes-Roth et al. 1986). BBL allows users to run a comprehensive, reachable, and motivational virtual classroom.

During the quarantine, several schools were struggling to find a decent digital tool for online smart learning. In higher education, the online smart learning tool that was operating smoothly was the BBL. Speedy (2020) stated that BBL is aiding the faculty to deliver high-quality virtual lessons thereby ensuring the continuity of learning and teaching particularly during the difficult time brought on by the pandemic.

The 21<sup>st</sup>-century teachers and students must be ready for the future and should be fully responsive towards technology implementation. The next generation of faculty and students are anticipated to think individually and solve technical issues. Silva (2009) confirmed that the new assessments in the digital era will not only measure the student's knowledge, it will also assess the soft skills. Some of the soft skills that would be measured by the new assessments include networking, time management, creative thinking, and work ethics.

Cognitive skills, human thoughts, and the abilities to solve problems are vital skills in the current education system. Dede (2008), mentioned that the 21<sup>st</sup>-century faculty and students should be equipped with cognitive skills. The cognitive skills can be human observations, recalling, consideration, and logical thinking. Whereas, Bernardez (2017), claimed that 21<sup>st</sup>-century skills consist of three types of skills – education skills, literacy skills, and life skills. In education skills, faculty and students should learn several skills such as critical and creative thinking, collaborating, and communication. In life skills, faculty and students should learn many skills such as learning to be flexible, socializing, productizing and leading. In literacy skills, the students can gain information, practice using the media and technology. Literacy across all the domains will increase. Faculty and students would be digital learners of the 21<sup>st</sup>-century (ibid).

Plenty of studies were conducted to inspect the efficiency of using BBL as a learning and teaching digital tool used in line with the traditional ways of teaching in a higher level of education. However, in the current research, the investigation was conducted where BBL is used as the main source of delivering courses in the higher education system in this particular institution in the UAE during the coronavirus (COVID-19). This tool is providing a virtual environment as well as a learning and teaching management system at the higher education level in the UAE. In addition to that, it is used as a remote learning tool during the COVID-19 virus quarantine period. Even though there are many tools to be used for online learning, the fourteen (14) branches of the higher education institution in which this study took place are using BBL as a main source of education during the quarantine.

There are several implementations of the BBL tool. This research aims to investigate the complete practice of teaching and learning at the higher level in the UAE, from the faculty perspectives. The

research rationale and research questions are provided in detail in the next section. Olive (2011), believed that there are three (3) elements that have a direct impact on the success of using technology in education. These include the type of digital tool used, the student's learning style and preference, and the teaching methods adopted by the faculty.

The current research has been conducted in the biggest and second oldest higher education institution in the UAE. This institution has 14 campuses for men and women in each Emirate around the UAE. The targeted participants of the research are the faculty of this institution from the 14 different campuses. The participating faculty are from different programs, including Business studies, department, Health Sciences, Media department, Education, Emirati and Arabic Studies, and Engineering, Foundation Studies, and General Studies. This institution utilized technology and launched BBL for the faculty and the students in 2001.

The main target of this present investigation is the faculty who is teaching in the chosen institution and experiencing this digital tool every single day by conducting remote education during the pandemic. In this institution, the faculty proficiency level in handling technology and digital tools stands at a moderate to master level. Faculty are from varied nationalities, different years of experience, and varied professional practices and diverse backgrounds. In this institute, all of the 14 campuses are well equipped with the BBL platform.

The disadvantages of BBL is that it does not provide any indication about the motivation and engagement level of the students while using the tool. No intellectual, emotional, and practical commitment is evidenced. Another disadvantage of BBL is that it does not include all students and therefore does not provide a sense of inclusion. The structure of BBL is limited as it is set as a template. It does not give the faculty members enough room to be creative or add their personal touch (Sleator 2010).

### **1.3 Problem Statement**

Many studies focusing on BBL to date were conducted based on the student's perspectives (see for example Abdalla, 2007). The objective of Abdalla's investigation was to highlight the correlation

between the BBL platform and the student's performance academically after the use of BBL. Most of the previous studies found out a positive correlation between the uses of Blackboard Learn and student's academic performance. This is indicative of the success of using BBL for improving the academic performance of the students. The gap this study aims to bridge is the faculty's experiences and perspectives of BBL in higher education. This study takes place in the UAE, and during a period of rapid transformation to remote online learning. It is anticipated that the results will be relevant to all those involved in higher education.

The context of the global pandemic and the requirement to quarantine in homes is a significant variable in this study. Before the quarantine, faculty were using BBL occasionally and not as a main source of learning. It was used occasionally when the faculty members felt that its application may improve the learning process. Many studies were conducted on the effectiveness of BBL while it has been used as an educational tool as an addendum to the traditional mode of teaching. However, in this research, the utilization of the tool and its corresponding implications has been examined during the quarantine (COVID-19). This is because the reliance on the BBL platform during the pandemic increased significantly. Most of the previous studies regarding the use of BBL before the pandemic reported a positive impact on students and faculty, but its use for 100% online learning has not yet been investigated.

Under normal circumstances, there is a positive relationship between technology and the educational field. Technology and education can be considered to go hand in hand (Christensen, 2014). Good content and the most appropriate type of technology creates an endless circle of achievement and success (Christensen, 2014). Earlier studies showed that technology integration in the educational domain affects the students and teachers attitudes positively. As a consequence, an increase in technology adoption is observed every day. Since the world has not witnessed another pandemic since the incorporation of technology in education, this study provides a unique perspective.

## **1.4 Purpose and Objectives**

The aim of the current study is; to explore technology integration in higher educational institutions in the UAE by evaluating the usability of BBL from the perspectives of faculty members.

A mixed methods research is used to investigate the suitability of BBL from the perspective of the faculty members based on their experiences during the quarantine in the UAE. The study tested research hypotheses, determining the relationship between variables and highlighting the obstacles that the faculty faced with the use of BBL. In addition, the current research aims to study the use of technology, and describe the effectiveness and the importance of using BBL, at the higher education level from the faculty standpoint. Further investigation about faculty's perspectives and practices on how they are using the technology, the challenges they faced, and how they overcame challenges faced while using this digital tool is also included in this study.

This current thesis has three research objectives, framed as the following:

### ***Research Objectives:***

- To explore existing literature on technology integration in higher education.
- To evaluate the usability of BBL from the perspective of the faculty member of the biggest and second oldest higher education institution in the UAE through a survey that includes questions based on the Likert scale.
- To understand the experiences and perspectives of faculty members on technology integration and BBL suitability through an interview conducted with the use of an open-ended questionnaire.

The current study focuses on three main objectives as mentioned above. It focuses on the existing literature on technology integration, as well as the data gathered from the first data collection tool which is the survey and the experiences of faculty members using the second data tool which is the interviews.



## 1.5 Research Questions

The present research questions are set to examine these elements and inspect the effectiveness of using BBL in higher education from the faculty's point of view. BBL was used on a regular basis before the coronavirus (COVID-19) outbreak, however, the presentence of BBL and Collaborate Ultra (CU) broke all records and reached the highest percentage of usage during distance learning in the quarantine. During the last week of March 2020, the Blackboard team recognized a 3,600% rise in the interactional use of the BBL virtual classroom, 'Collaborate Ultra' (Speed 2020).

In the light of this framework, a total of four (4) questions are prepared for this study. One (1) main overreaching research question and three (3) specific questions framed as the following:

### **Main research question:**

How is technology integration in higher education occurring in the UAE? And how do faculty members perceive the usability of BBL in higher educational institutions in the UAE?

### **Specific research questions:**

**Research Question 1:** What are the trends and developments accounted for in the literature on technology integration in higher educational institutions in the UAE?

**Research Question 2:** How is BBL used to realize the technology integration in the higher educational institutions in the UAE?

**Research Question 3:** What are the experiences and perspectives of faculty members on the usability of BBL?

In closing, the research purpose, objectives, and research questions have been presented to create a clear path for this study of technology integration, specifically the BBL platform in higher education.

## **1.6 Rationale to the Study**

This research intends to investigate faculty's perceptions of the use of BBL as the main source of remote learning during the pandemic. In addition, the summary of the participant's data will direct the researcher to recommend effective strategies and frameworks to develop the remote learning practice at the higher education level in the UAE. The faculty feedback is critical. As the challenges and areas for the development of BBL are highlighted by the faculty members, the digital tool can be further improved. The research started by reviewing a holistic and empirical consideration of the faculty's perceptions of BBL practice, either locally or internationally, by analyzing quantitative indicators of faculty course delivery using BBL.

Previous BBL studies were captured from GCC counties such as the United Arab Emirates (UAE) and the Kingdom of Saudi Arabia (KSA). International investigations were conducted too from South Africa (SA) and the United States of America (USA). Two (2) studies from the UAE and two (2) studies from South Africa were also conducted for determining the efficiency of BBL. However, none of these studies has investigated the use of BBL during a time of crisis that required all learning process to be shifted to an online platform.

This research aimed to interpret the data gathered and discuss the faculty's professional experiences of using BBL during the pandemic. In addition to that, this current research aims to investigate the faculty's recommendations from the findings for empowering the faculty to deal with challenging circumstances such as a pandemic.

This research is aimed at examining the use of BBL in the UAE based on the perceptions of the faculty members. It also aims to contribute to the higher education scheme in the UAE as prioritized by the National Agenda of the UAE Vision 2021. For that purpose, this thesis has uncovered perspectives regarding the sole platform for online learning at the UAE's largest higher education institution, and offer recommendations that benefits faculty and other stakeholders of higher education in the country.

Technology has been studied for decades, but the use of technology is attracting worldwide attention with each passing day. According to Aloklok (2018), the practice of BBL at Taibah University in the Kingdom of Saudi Arabia (KSA) has influenced the academic information management system in a positive manner. Under, the current education system, the priority for the digital integration of technologies have changed. Digital tools and technology are considered to be a priority. Thus, BBL which was used as a tool for enhancing the traditional teaching style became critical for transforming the conventional educational practices and facilitate the incorporation of digital tools. Therefore, BBL enabled stakeholders to focus on virtual online teaching and its efficiency which suites the current situation of the technology revolution (ibid).

Learning acquisition usually cannot be questioned. However, Olson & Bruner (2003), declared that “The acquisition of knowledge as the primary goal of education can be seriously questioned” (p. 150). On the other hand, Aloklok (2018), demanded that BBL offers many instructive and informative ways of knowledge presentation and achievements. It allows faculty to create groundbreaking ways to provide the course information. BBL is allowing faculty to provide a motivational learning environment for their students as well.

BBL was used in South African universities for the first time ten (10) years back in 2010. Boshielo (2014), claimed that 43% of the sampled students who are using BBL noticed a performance improvement. The University of Limpopo in South Africa conducted a study to estimate the influence of BBL as a learning tool on the student’s performance. The researchers agreed that BBL has indeed boosted students’ academic performance as it offered direct access to learning materials. It provided a platform through which faculty members could instantly respond to students inquires. Furthermore, it made the communication and cooperation between students easier.

Another recent study on BBL led by Qamhie, Benkraouda, and Amrane (2013), who are faculty members from the UAE University at the Al-Ain, assumed that using BBL in a difficult and complex course such as a physics course will not be a good idea. However, the findings showed that BBL was an effective tool for teaching both easy and difficult courses. Researches proved that BBL improved the interactions between students and faculty. Thus, the student’s perceptions and

attitudes improved towards learning difficult courses such as physics (ibid). In UAEU, the faculty members Qamhieh, Benkraouda, and Amrane (2013) found out that the online assessments enriched the student's learning. Faculty and students found BBL as an active and excellent learning management system.

At Park University in the United States (U.S) another examination of BBL and Collaborate Ultra has been conducted to study the effectiveness of BBL and its virtual classroom environment. This study confirmed that the number of students who registered in online courses increased since the implementation of BBL and Collaborate Ultra. Additionally, the satisfaction levels among the students improved with the implementation of BBL and CU (Tonsmann 2014).

## **1.7 Structure of the Dissertation**

This thesis is organized into five chapters. This chapter (Chapter 1), has presented background information on the educational context of the United Arab Emirates, and the history of higher education in the country. Additionally, the chapter has provided information relating to the specific focus of the study, that is, the BBL platform. It has also defined the research purpose, objectives and questions, and outlined the significance of the study. A detailed and in-depth review of existing literature and an explanation of the selected theoretical framework is provided in Chapter Two of this thesis. In Chapter Three, a full description of the research approach and research methodology is covered. In Chapter Four, a presentation of data collected from faculty surveys and interviews is analyzed and discussed. Chapter Five covers the inferences drawn from the research finding. Additionally, the conclusion, recommendations, and limitations are also included in this chapter. Lastly, the scope of further study of this topic is provided.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Overview of the Chapter**

This chapter discusses the relevant themes of the research topic based on two different contexts. The first context is the research conceptual framework, and the second context is the research theoretical framework. The focus, in this case, is the implementation of BBL software which will be discussed at the end of this chapter. First of all, this study starts with highlighting the conceptual analysis that is related to the practices of technology integration in a particular higher educational organization. The focus is technology integration through the use of BBL in higher education in the UAE (Section 2.2). The conceptual analysis was grounded on three main themes. Firstly, the technology integration in higher education, secondly, the current situation of the COVID-19 pandemic, and thirdly, remote learning in higher education. Most of these key themes contain subheadings that are required to be analyzed and discussed from different perspectives.

Secondly, in the theoretical analysis (Section 2.3) a total of five (5) theories were selected. Some of the theories were outdated and some were current. All these theories that were analyzed from varied international backgrounds were established by experienced theorists in the educational industry. These theories that were selected are based on the relevance to the research topic and they can add more knowledge to the existing one. Selected theories were divided into two main categories, the broad theories and the specific theories.

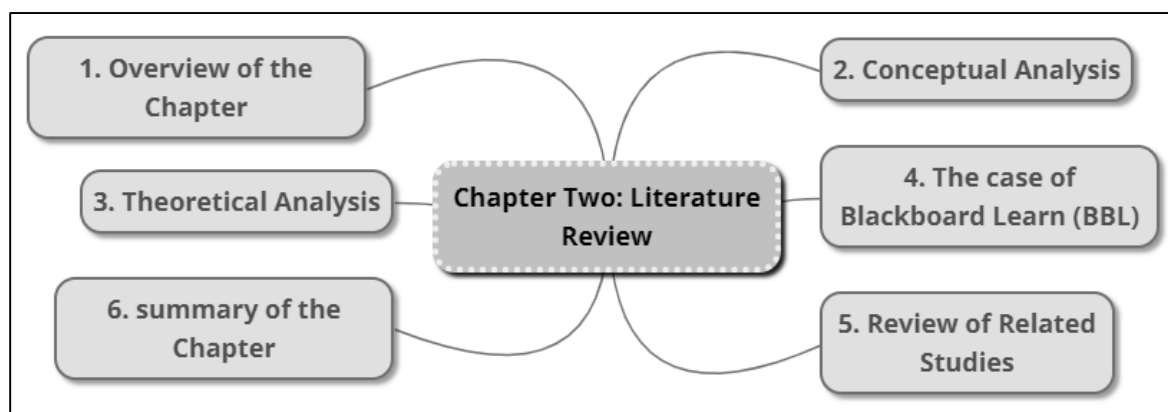
The purpose of selecting broad theories is its direct connection with teaching and learning. The board theories are – Scaffolding and Zone of Proximal Development (ZPD) and Activity Theory (AT). Additionally, the specific ones are the current theories. These theories were selected because they are linked with technology integration (TI) and BBL practices. Three specific theories include – TPACK, Connectivism Learning Theory (CLT) and Bloom’s Digital Taxonomy (BDT).

The last part of the literature review discussed the case of BBL (Section 2.5). This section discusses the relevance of BBL to the future practices of remote education and technology integration in the

UAE during the period of the (COVID-19) pandemic. Definitions of BBL are presented, as are the practices of technology integration internationally and any related irregularities.

These irregularities include the processes of BBL utilized by the faculty, ways of using this educational tool in the classroom, the development stages, and obstacles faced by the faculty. In addition, the best practices in BBL, from the faculty's point of view were taken into considerations as well. Moreover, this research discusses the different practices BBL offers to higher education.

Section 2.6 will highlight similar previous studies from a number of countries and higher education institutions (HEI) such as the Kingdom of Saudi Arabia (KSA), South Africa (SA), Turkey, Portugal, United Arab Emirates, India, Lebanon, and Jordan. Additionally, the suggestions of previous studies so far on technology integration and BBL and the challenges and the opportunities associated with this digital tool have been discussed. The overview of the literature review chapter has been exhibited in Figure 1.



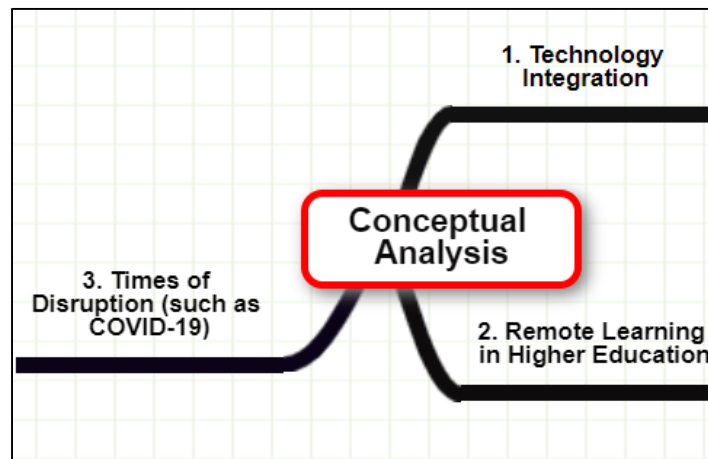
**[Figure 1: the overview of the literature review]**

The above Figure 1 shows the structure of this research literature review. The main three points are conceptual analysis, theoretical analysis and BBL. However, chapter two (2) starts with an overview. Thereafter, a detailed conceptual analysis is included. The third point of this chapter is the theoretical analysis. Thereafter, BBL, the digital tool selected for this empirical study is discussed. Subsequently, a comprehensive review of related literature and previous studies on the

same topic of technology integration and BBL is done. The last point of chapter two (2) is a summary that highlights the key trends related to the research topic.

## 2.2 Conceptual Analysis

This, conceptual analysis focuses on the main terms of this research related to the blackboard. The main themes of this conceptual analysis are demonstrated in Figure 2 below.



[Figure 2: Conceptual Analysis key themes]

The above Figure explains the key three themes that are discussed within the conceptual analysis. This section will define the keywords for the study (Section 2.2.1), discuss technology integration in higher education (Section 2.2.2), discuss doubts held by faculty over such integration (Section 2.2.3), cover remote learning in higher education (Section 2.2.4) and the impact of the Coronavirus pandemic on the education system (Section 2.2.5).

### 2.2.1 Research Keywords

This section introduces the terminologies that will be used throughout this research. These terms are - Digital tool (DT), learning management system (LMS), BBL, Pedagogy, Virtual learning environment (VLE), Higher Education (HI), Higher Education Institute (HEI), Technology Integration (TI), Technology Management (TM), Faculty, Learning and teaching, Coronavirus

(COVID-19), Collaborate Ultra (CU), Quarantine, Remote Education (RE) and Work From Home (WFH). Some terms are straightforward that doesn't need any clarification whereas some will be defined separately as the following.

**Technology Integration (TI):** Technology integration can be defined as the incorporation of technologies in the classroom for educational purposes where the teacher needs to work as a facilitator. Technology is integrated differently among teachers for many reasons, the teacher's beliefs being one of them (Kim et al. 2013).

**Faculty using Blackboard-Learn:** All faculty members, both male and female, are committed to achieving their teaching course objectives using the Blackboard-Learn tool in different areas and domains. This tool has been in use for several years. Under the prevailing circumstances of the pandemic, all faculty members are expected to use the BBL in their course module in this organization.

**Higher Education Institutions (HEI):** This refers to organizations in the UAE such as, universities, colleges and institutes that provide high education facilities. Furthermore, it offers a large variety of virtual learning environments and smart learning tools. Besides it provides various programs through which faculty and students can meet face-to-face or online to ensure the teaching and learning process works seamlessly. The research was conducted at one of the tops certified higher education institutions in the UAE.

**Blackboard-Learn (BBL):** This is a digital tool that provides a virtual learning environment (VLE) and learning management system (LMS). It is a key tool to be used in higher education institutions in the UAE in both the private and the public sectors (Kellam, Cox & Winkler 2009).

**Coronavirus (COVID-19):** This is a novel and life-threatening virus which originated from bats. It was first identified in Wuhan, China in December 2019. Approximately 96,000 people were infected with the coronavirus and there were approximately 3300 deaths. As a result, all the residents were asked to stay at home and all stores, malls, and even mosques were closed down in an attempt to contain the spread of the virus (Singhal 2020). One of the most common



misconceptions of the coronavirus (COVID-19) is that the sickness and death of this virus are connected more with elderly people. In addition, it was also revealed that people with comorbidities such as cancer or diabetes will be at a high risk of being infected with the virus (Bersanelli 2020).

**Collaborate Ultra (CU):** This is a tool that is used to do actual video conferencing. It allows the faculty members to interact with their students by sharing files, pictures, PDFs, applications, PowerPoint and even using a virtual whiteboard in the session. There is no need to download any software for gaining access to Collaborate Ultra as it is available within the BBL portal (Robbs 2017).

## **2.2.2 Technology Integration in the Higher Education**

In this part of the research, two key concepts will be discussed in detail - the first one is technology integration and the second one is the faculty's doubts regarding technology integration at the higher education level.

### **2.2.2.1 Technology Integration**

Plenty of teachers currently are able to comprehend the significance of the technology in the classroom. Most teachers stressed the restrictions associated with integrating technology into the curriculum. There are, however, two barriers that cause hindrances in the process of technology integration - internal barrier and external barrier. The external barrier is the teachers' inadequate technical skills and it can be resolved by providing proper training for all teachers to make sure that they are all on the same page regarding the application of this technology. The second barrier is the pedagogical simulations of the technology practice (Ertmer 1999). Both internal and external barriers ought to be addressed to implement the technology effectively. Back in 2009, a study revealed that teacher's literacy skills are linked significantly with pedagogical practice. Technological training, therefore, ought to be mandatory for all faculty (Georgina and Hosford 2009).

Technology should be integrated into the curricular itself or systemically or in both ways. The National Survey of Informational Technology conducted a survey for investigating the integration of technology in higher education. The findings demonstrated that technology integration is still the most urgent and important concern. Training the faculty in the higher education level regarding the application of technology does not confirm that the faculty will implement it effectively in the classroom. It needs an adequate development program, learning styles and technological support that is available at the faculty's disposal (Rogers 2000).

Technology implementation is increasing in the UAE. It is a keystone in the UAE's society because it improves the student's performance significantly. Teachers in the UAE are using several technologies to enhance the knowledge base of students. Previous studies showed that the usage of smart devices at home increased and smart devices being used at schools are increasing as well in the UAE. Male teachers were observed to be more inclined to integrate the technology in their classroom as compared to female teachers in the UAE (Almekhlafi and Almeqdadi 2010).

### **2.2.3 Faculty's Doubts of Technology Integration in Higher Education**

The faculty has some concerns regarding technological education and technology integration. The implementation and the flow of the technology integration is a complex procedure (Medun 2001). As reported by Hansen (1995) there are three central concerns regarding technological education for teachers. The first concern is related to ways in which technology could be linked to information delivery. The second concern is the late feedback received on some tools as well as the lack of proper study regarding the previous practices in imbibing technology in the field of education. The third concern is the inadequate proficiency of the teachers in using technology. In order to develop teachers' technological education, they need plenty of personal and environmental elements which are sometimes difficult to accommodate or even recognized (ibid).

Technology and education are interconnected. Avans (1995) claimed that Technology and Education are the two elements that significantly influence international trends. Technological education and distance education, in theory, enables students and faculty members to overcome

the barriers which impede the process of improvement of the educational practices. Besides, the integration of technology in education has a significant impact on women's development.

Women can get more advantage of technology and online application at work. Avans (1995) mentioned that women around the world have some limits in terms of time, space, personal and family issues, income and social incapacities. Thus, technological education and distance education can help them come out of their comfort zone and study from home. Therefore, the integration of technology in education allows women to work on their individual improvement while honoring their familial commitments (ibid).

#### **2.2.4 Remote Learning in the Higher Education**

In this part of the research, three key concepts will be debated in details: remote education, history of remote education in the higher level of education and perceptions of remote education around the world.

##### **2.2.4.1 Remote Education**

Remote learning is a combination of web-based tools and systems used to provide education. It targets all levels of learning from early education to higher level of education. It has diversified systems and security protocols based on the needs of the client. Besides, providing login credentials for the faculty and students, enables them to communicate seamlessly and protects the users from data theft (Patterson 2013). Apart from data collection, it provides user-friendly software for remote education. Faculty members can upload lectures or provide live presentations for all levels of education. According to Rigby and Dark (2006), remote learning should implement a hands-on activity, be flexible and serve multipurpose needs. On the other hand, remote learning may negatively impact the student's interaction and motivation levels (Arkorful and Abaidoo 2015).

A factor that makes BBL stand out amongst its competitors is its continuous improvement. It has an instilled vision of progressive technology and seamless integration. In spite of the complex

architecture and design, the user interface is user-friendly. Many users specially experienced faculty members have issues with modern technology and classify themselves as Luddite. BBL focuses on all such users. It enables all users to get on board without facing any difficulty through its simplistic interface and support system. This tool uses a three-pronged approach to fulfil its purpose. It aims to achieve collaboration and accessibility. It does so by providing virtual classrooms and modern tools for effective learning. It also aims to cater to all groups and provide a feasible platform for students and faculty.

The implementation of e-learning and BBL needs practice. Patterson (2013) provided an in-depth analysis of learning complicated skills and techniques to become an expert of BBL. This is also one of the reasons behind the pessimistic views of faculty members regarding virtual and online learning. Their Luddite attitude makes it difficult for them to learn the operating procedures and tools of online education. Therefore, the implementation of online models requires a gradual approach.

The industry in which BBL operates is highly competitive and rapidly evolving. It has rivals in the ERP and LMS provision with companies like SAP and SAKAI providing similar services to clients (Gredler 2009). However, BBL's education-centric nature and targeted approach make it more appealing to dedicated educational institutes. On the other hand, its remote and distant learning tools are also heavily contested by companies like ZOOM. The main factor that put BBL above the rest is its complete package and comprehensive learning solution (Anon 2020).

#### **2.2.4.2 History of Remote Education in Higher Education**

Online learning and education have rapidly increased in importance and new models are used by faculty to provide convenience and flexibility to students. Online learning modules have developed greatly to support remote education for higher levels. Their complicated curriculum and requirements are met through e-learning software and management systems (Poon 2013). Hartsfield (2011) emphasized the idea of e-learning in higher education. It is an important tool in diversified fields of study and caters to the needs of faculty members. Education at higher levels comprises lecture and presentations with little emphasis on the need for social integration and physical connection.

Higher education and Blackboard Learn to go hand in hand. Heirdsfield (2011), mentioned that this basic structure of education is sufficient for higher-level courses. The author also pointed out the favorable aspects of the transition towards remote education and the need for the whole educational system to move towards it. According to her, remote learning is more efficient in dealing with part-time and full-time students as it provides flexibility in terms of time and place.

All of these benefits of remote education have yielded great results and increased productivity. Mhkize (2015) presented similar arguments for remote learning. The researcher also mentioned the link of technological advancements with the efficiency of higher education. Likewise, a blended learning model including distant and traditional learning was examined and portrayed as an innovative idea (ibid).

On the contrary, researchers pointed out the issues with e-learning and how it restricts the output for all users involved. Based on the point of view of the students, it has been observed that they face challenges much like what they used to with remote learning models of education (Song 2004). The researcher also identified problems like network connections in remote areas which is a major hurdle for students. It gives an unfair advantage to some of them. The researcher also pointed out the issue of plagiarism and the use of unfair means in online assignments and examinations.

Another researcher Merwe (2011), presented a microeconomic analysis of online learning and its impact on stakeholders. It is a useful counter analysis for the pros and cons of remote education and its historical origins. It also sheds light on its future impact and consequences. The impact of online learning and time spent on courses on the grades and performance of students was studied. The research was conducted in 2011 at Durban University of Technology. Through a regression analysis, the said researcher concluded that the amount of time spent by students on online classes was positively correlated with their grades. Another important factor influencing the grade was identified as gender. The author's study formed the basis of methods and procedures of motivating students and engaging them in online classes.

Online learning also influences other stakeholders. BBL is not only for faculty and students, it has been used by the administrative staff as well. According to Missula (2008), the staff's use of BBL as a remote education tool is directly linked to its applicability and usefulness. All these factors have a profound impact on the feasibility of using online or blended learning models for higher education.

#### **2.2.4.3 Perceptions of Remote Education around the World**

Technology and remote education, undoubtedly, influence the performance of the faculty and students. Lederman (2020), wrote extensively on the impact of remote learning and education for the faculty and students. Its impact was examined through surveys and questionnaires collected from professors and students in different universities around the world. His research focused on the transition from traditional methods to online learning because of COVID-19. Many colleges and universities were left with no choice but to shift towards e-learning and teach students through web-based applications. The widespread transition allowed to research a wide range of users and record their perception towards this change (ibid). On the other hand, remote education may influence communication negatively (Arkorful and Abaidoo 2015).

Technology is a path that all educators must choose and go through it. Associate Professor of American University in Cairo, Maha Bali (2019) showed her concerns towards the rapid change and transition towards remote education. She mentioned the problems that the faculty was facing and showed the roadmap for the future. She added that the biggest challenge was to ensure that the learning outcome of students is met. This was a problem for faculty members as many universities were closed during the semester and part of the curriculum was already taught through traditional methods. They had to quickly adapt and ensure that the mental health and well-being of their students were not compromised.

A different perspective was observed in the Plymouth State University in England. The director of the university, Robin DeRosa (2019), explained that the previous experiences of faculty and students with the integrated systems allowed them to transition smoothly and the overall response

towards remote education has been positive. Her comments showed the wide range of experiences and attitudes towards distant learning and how it varies across countries.

Communication is a key component in the learning process. As specified by İŞMAN (2004), communication barriers in distant education hinder the efficacy of the learning process. These barriers are different for each educational institute to remove these barriers, universities must try to identify these barriers promptly and include their students in all decisions. An inclusive approach is the only way to solve the problems associated with distance learning and realize its true potential. There are different strategies to solve remote learning problems. She mentioned seven dimensions and a goal-oriented approach to shift the curriculum towards virtual learning.

Many of the strategies that solve the issues related to remote learning have been applied which in turn yielded positive results in recent years. In a qualitative study by West (2007), the implementation and deployment of learning management systems were researched. The author identified primary attributes in distant learning which are necessary for the fulfilment of educational objectives and learning outcomes for students. The researchers analyzed the impact and consequences of remote education in a survey.

Twenty (20) faculty members from around the world were asked to contribute to the survey. Their perceptions about the usefulness and efficacy of learning tools in online education were recorded. The survey results showed that the learning of educators and instructors was crucial to improving the efficacy of remote education. They faced challenges in operating the system and using web-based programs for their classes. The research of West (2007) showed that the issues and problems can be solved through teachers' training workshops. This can significantly change their perception about distant learning, even prior to the inclusion of technology in higher education.

### **2.2.5 The Pandemic of Coronavirus (COVID-19) and Education**

In this section of the study, three key concepts will be argued. The first concept is the coronavirus (COVID-19) and its description. The second one is the challenges faced by the faculty during the pandemic of COVID-19. The third and last point in this part of the research is the real heroes of the corona virus (World Health Organization 2020).

### **2.2.5.1 Description of Corona Virus (COVID-19)**

COVID-19 is an infection caused by a novel virus. The people who are infected with diseases will experience minor to moderate illness similar to the flu. This kind of infection will not call for special treatment as the individual's immunity is capable of fighting the infection. On the other hand, people who have underlying medical issues like cancer, high blood pressure and diabetes were more prone to contract the deadly virus (World Health Organization 2020).

The ways that can prevent spreading this virus is raising awareness among people by informing them how the virus spread and the measures they can follow to protect themselves and others. The first piece of advice involves staying at home unless there is an emergency, washing hands, sanitizing everything at home frequently and avoiding touching one's face. Until now which is July of 2020, there is no medication, vaccination or treatment for this virus. The World Health Organization (WHO) is still doing clinical experiments to find a treatment for this illness (World Health Organization 2020).

### **2.2.5.2 Faculty's Challenges during the Corona Virus**

Coronavirus has been a driver for the digitalization of the global education system. It pushed the education and all other ministries that have customer services commitment to shift to an online approach using the most convenient digital tool. This virus has shown the world that there are no limits between individuals, ministries or even countries. This is because the virus can affect all living people across the globe. Three months of COVID-19 have facilitated the process of finding a solution for education and the shift to alternatives of remote learning to battle the disease (Sun, Tang and Zuo 2020).

In these difficult times, teachers are expected to fulfil their responsibilities of teaching. However, teachers are stressed to work hard in order to plan interactive and innovative lessons for their students during the remote learning sessions. In the absence of traditional teaching and face to face lessons, the student's attention span is less than normal. Therefore, the teachers need to put more efforts to get the student's attention and come up with good online activities. Designing creative



and engaging online activities require hours and hours of searching and navigating. This virus pushes the whole world to work online remotely (Sun, Tang and Zuo 2020).

### **2.2.5.3 Heroes in Today's Pandemic**

. During the quarantine period, another very important factor that affects the educational process are the parents. Most parents in the UAE are working from home, teaching, monitoring and facilitating their children's learning. The Gulf News declared that the parents are the silent heroes during the coronavirus in the UAE as they managed to multitask to make the whole experience smoother and stress-free for their children (Reporter & Zaman 2020).

## **2.3 Theoretical Framework**

In this part of the study, the theoretical framework will be discussed. A total of five theories were reviewed, which included both broad and specific theories. The broad ones are Scaffolding and Zone of Proximal Development and Activity Theory. Whereas, the specific ones are TPACK Theory, Bloom's Digital Taxonomy and Connectivism Theory as the following;

### **2.3.1 Theoretical Framework Outline**

The theoretical framework provides a comprehensive understanding of the theories that are used to underpin the study. It is also referred to as a construct of theories that supports the study (Research guide 2020). Research is meaningful and consistent when it is based on a strong theoretical framework. Both the theoretical framework and methodology are key to understanding and effectively interpreting the research findings (Glense 2011).

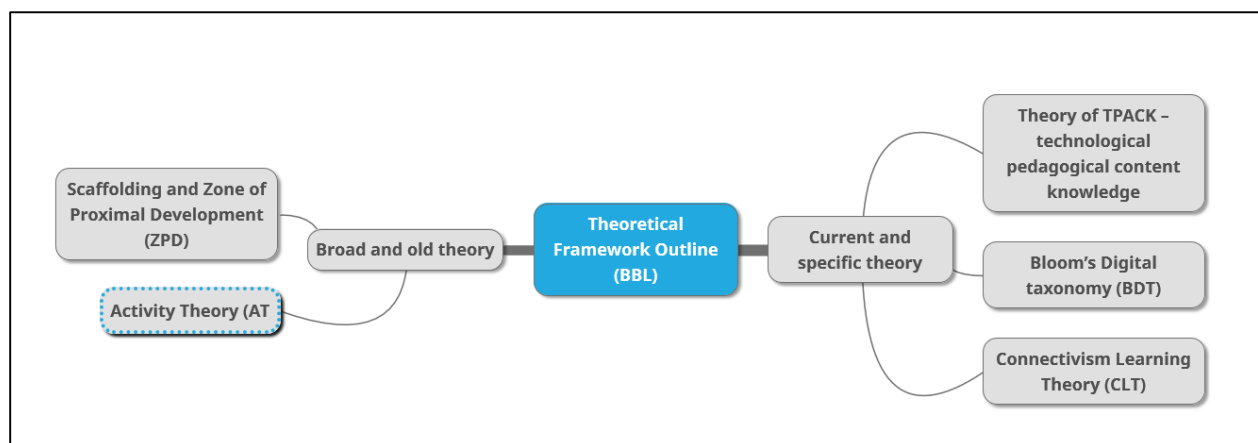
Generally, a framework could be defined as a support system or integrated structure which combines elements or parts of an operation (Anon 2020). A theoretical framework, on the other hand, is a string of connected concepts merged together to form a conclusive argument or hypothesis in the research. It is the foundation on which the research and argument are built. The framework is supported by the variables and factors which are relevant to the current study.

Empirical evidence suggested that technology integration through the use of BBL for teaching is based on many dependent and independent variables (ibid).

According to a study by Borgatti (1999), dependent variables include performance, technical expertise of staff and faculty, cultural biases, perceptions of stakeholders and program characteristics etc. These are dependent upon other factors like network issues and education levels in the region. In order to understand the theoretical framework, a detailed assessment of the organization's own structure is necessary. BBL uses the SIS Integration framework to connect students and teachers.

A general theory applied for the research was the Unified Theory of Acceptance and Use of Technology (UTAUT). It is a credible method for resource augmentation and variance analysis. According to Venkatesh, et al. (2003), UTAUT can be used to examine behavioral variances to an extent of 70%. The analysis method compares historical information with current trends and uses the variables to demonstrate a relationship.

The result can show the attitudes and perceptions for any given topic. This can then be used to compare the results with other models of acceptance. As mentioned above, theories applied to measure and examine the perceptions of faculty towards BBL were the theory of TPACK, Bloom's Digital Taxonomy (BDT), Connectivism Learning Theory (CLT), Activity Theory (AT) and Scaffolding and Zone of Proximal Development (ZPD) theory (illustrated in Figure 3).



[Figure 3: Theoretical framework outline]

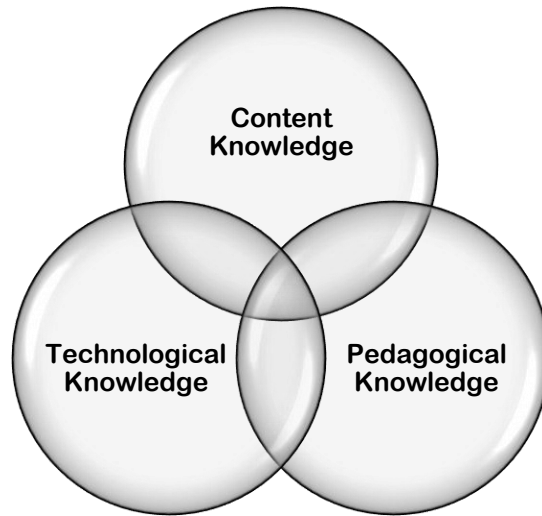
As shown in Figure 3 above, a total of five (5) theories underpins this study. Three (3) of the theories were specific, current and have a direct connection to technology integration in education. For instance; the Theory of TPACK is Technology, Pedagogy, and Content Knowledge. The second one is Bloom's Digital taxonomy (BDT) and the third one is Connectivism Learning Theory (CLT). Two of the theories were traditional and broad theories – Activity Theory (AT) and Scaffolding and Zone of Proximal Development (ZPD).

### **2.3.2 Specific Review of Learning Theories**

This part of the study discusses the specific theories in details. Three specific theories were selected as they linked directly to the topic of the study. These include TPACK, Bloom's Digital Taxonomy and Connectivism Learning Theory.

#### **2.3.2.1 Theory of TPACK – Technological Pedagogical Content Knowledge**

TPACK theory is a theory and a framework that focuses on three main components – technology, pedagogy, and content knowledge. TPACK framework was developed by Lee Shulman. According to Graham (2011), the implementation and integration of this theory are increasing around the world as many researchers are investigating the topic of technology integration within the context of education. Whereas, Rodgers, (2018) defined TPACK as an assimilated framework that can be used to explain the usefulness and applicability of an online learning tool. It combines the analysis and knowledge of three paradigms which are technological, pedagogical, and content knowledge (as shown in Figure 4).



**[Figure 4: TPACK Theory Model]**

TPACK theory stands for technological, pedagogical and content knowledge as illustrated above in Figure 4. The collaboration of these three concepts provides a rich environment that improves the quality of learning and teaching. As explained in a previous study conducted in 2015, the three components of TPACK theory are significantly correlated with one other (Pamuk et al. 2015). On the other hand, Koehler, Shin, and Mishra (2012) claimed that TPACK theory works in a very unique way. It acts as a lens for concepts in educational technology and this lens is a concrete lens. It also works as a classification tool that offers awareness of the subjects such as, ideas, actions and relationship under inspections. It highlights the related issues and ignores the unrelated elements when it comes to extraordinary aspects in educational technology (ibid).

Technology and content play a huge role in education. In the opinion of Koehler, Mishra and Cain (2013), the perfect teacher ought to involve this three main aspect in addition to knowledge in the teaching process to ensure its efficacy. This is because it is believed that the interaction of these three elements will facilitate the effective achievement of the lesson outcomes. The interaction of content, pedagogy and technology make teaching and learning successful in theory and in practice. TPACK approach offers flexibility for teachers. Unlike other approaches which are based on a 'one size fits all approach, the TPACK approach allows teachers to work in different contexts and environments (ibid). However, TPACK theory has some drawbacks. Using technology will not

improve teaching or learning if the teacher does not perform her or his role of planning the lesson and practicing the technology tool prior to the lesson. Therefore, teachers should be well prepared and test the digital tool before the lesson in order to ensure its efficacy (Roblyer and Doering 2010).

Faculty members use the TPACK theory as a guiding tool to provide the most effective ways of learning and teaching. This includes lesson which is supported by appropriate communication and the latest technology for the benefit of the students. Technology knowledge is the first aspect that determines the success of a learning module in TPACK. In addition, teachers should give themselves enough time to practice the digital tool that they will be using. Niess (2011) claimed that the main target of TPACK theory is to recognize where, when and how to use a particular knowledge and approach in order to direct the students and their learning. A previous study that used the TPACK framework revealed that students showed a higher level of understanding after the integration of the theory (Archambault and Crippen 2009). In addition, teachers felt more confident after the integration of the TPACK framework (ibid).

It has been discussed in previous studies that effective teaching does not only involve the use of digital tools but also require regular teaching and learning. Indeed, faculty should introduce the technology for the students by presenting the new tool for them and allow them to try it. TPACK theory states that the teachers should enable the learners to use the technology to create a dynamic relationship (Archambault and Crippen 2009). On the other hand, Roblyer and Doering (2010), believed that utilizing technology is brilliant but incorporating technology in a lesson is a time-consuming process that requires significant efforts and can be overwhelming.

Faculty who know how to handle the technology in the classroom, effectively influence their students to learn more. Previous studies showed that faculty members with adequate knowledge of technology have been successful in providing better quality education to students (Graham et al. 2009). Siemens (2017), confirmed that the three broad educational theories which are Behaviourism, constructivism and cognitivism are the most popular theories used to create the instructional environment. Despite the previous fact, these theories were developed a long time

ago when the world was not driven by technology and digital educational tools. Thus, nowadays technology should be taken into consideration for creating an instructional environment.

In order to attain the maximum potential from online learning, all these aspects have to be analyzed separately and integrated into a virtual classroom. Technology refers to the system architecture and software in the learning method for e.g. BBL Virtual Classroom which is Collaborate Ultra (CU). In terms of technology, BBL has been a pioneer and leading brand for remote learning. Its diversified tools and features enable universities to establish a comprehensive learning structure (Derrick 2011). The technological aspect of TPACK is, therefore, crucial for the importance of technology integration and BBL.

Many issues like acquisition cost, running costs, accessibility and time lag are predominant in online learning models. In addition, Kurt (2019) believed that the cost of BBL is a significant hurdle in its implementation around the world. She mentioned the positive aspects of technology that enhances learning is the fundamental determinant of the importance of BBL. According to her, software and hardware along with acknowledged literary practices are an important element found in BBL architecture. It has resolved its technological lapses and improved its overall performance.

Therefore, the technology used in the virtual classrooms and learning management system provided by BBL caters to the needs of its clients and encourages students to learn. It can be assessed from the study of West (2007) that the implementation of BBL improved the grades and performance of the students surveyed.

The second aspect to determine the success of a learning module in TPACK is Content Knowledge. Content Knowledge (CK) is the nature and type of knowledge transmitted to students in a course or program. Many complicated and complex courses can now be taught through online systems because of advanced tools and fast internet connections. BBL is extremely useful for basic level as well as advanced courses because of its scalability. In addition, BBL is a highly flexible tool which makes it beneficial (Kurt 2019).

Finally, Pedagogical Knowledge is the third and last aspect that determines the success of a learning module in TPACK. Therefore, it must be considered to assess the importance of any online learning system. Mishra & Koehler (2006) defined pedagogy as the method and procedure in which an educator imparts the knowledge and content of the course. In the case of BBL, pedagogy is an important aspect that defines its role and usefulness around the world. It also results in different perceptions due to varying pedagogical approaches.

The three aspects of knowledge, as per the TPACK Theory, are integrated to form a sound assessment of the impact of BBL in higher education. Issues like limited technical knowledge of faculty and network issues still persist but the overall importance of BBL in higher education cannot be overlooked. The combination of Technological Knowledge and Pedagogical Knowledge contributes to the development of TPK or Technological Pedagogical Knowledge, which explains the link between web-based tools and teaching practices (Kurt 2019).

Faculty preferring to teach in a traditional way will not be able to obtain the best result from the Technological tools offered by BBL. TCK or Technological Content Knowledge is the link between technology and the content of the course. A course content requiring social interaction and integration will be difficult through a distant learning method. PCK or Pedagogical Content Knowledge is the link between teaching practices and content. It is vital for both traditional and remote education methods (Rodgers 2018). Integration of all three gives TPACK.

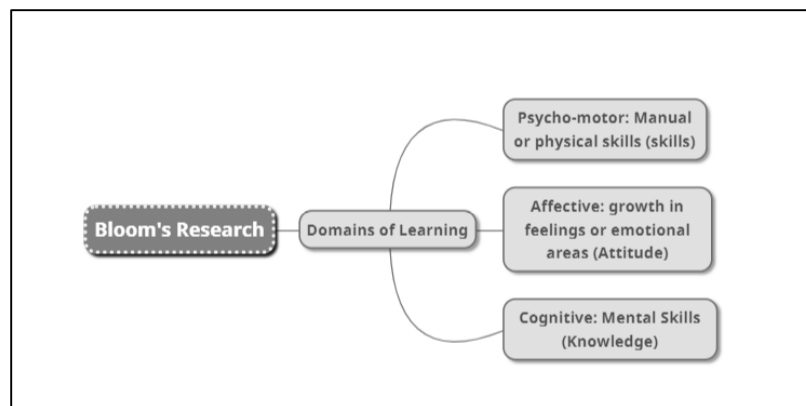
Applying TPACK theory to BBL suggests that it has all bases covered. It provides advanced technological tools, assists educators, and provides them with the flexibility to use their own teaching methods. Besides, it empowers the faculty to impart the content and knowledge of the course to students through the use of digital tools. TPACK is an essential theory as it provides a balanced framework of implementation, monitoring and assessment of online learning modules (Anon 2020).

Any change in education involving technology can be analyzed using the TPACK theory. Since it covers all aspects, it can identify the issues in implementing technology like BBL's Learning Management System. If the issue is pertaining to pedagogy and teaching methods, institutes can

opt for teacher's training programs and workshops. If the issue pertains to content and course knowledge, then an appropriate mix of physical and remote education may be developed. Therefore, any teaching method must be analyzed beforehand to avoid costly implementation and issues in any of the aspects of TPACK.

### 2.3.2.2 Bloom's Digital taxonomy (BDT)

In 1950, Benjamin Bloom created and developed taxonomies that consisted of a number of objectives based on educational purposes. His proposal aimed to use the learning objectives and impact three psychological areas in student. The first area includes cognitive developments which focus on dealing with knowledge and processing information. The second area is the effective area which focuses on senses, feelings and attitudes. The third and last area is psychomotor which focuses on controlling physical abilities as shown in Figure 5 (Churches 2007).



[Figure 5: The first version of Bloom's Taxonomy map by Churches 2007]

As shown in Figure 5, the first version of Bloom's taxonomy (BT) divided learning into three (3) key domains. The first is the Psycho-Motor skills and these include the physical skills of the learner. This domain includes varied categories like perceptions, origination, guided response, and adaptation. The next domain of learning is the Affective domain and it is the emotional growth and the learner's feelings. It is all about the learner's attitude and includes several categories like value, identifying a phenomenon, reacting to a phenomenon, and organization. Lastly is the



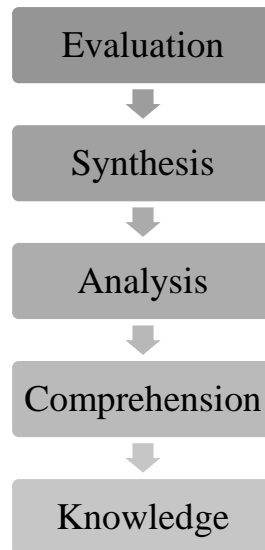
Cognitive domain, which refers to mental abilities. It is all about the learner's knowledge and includes varied categories like comprehension, application, analysis, and evaluation (Churches 2007). Knowledge and learning never come to learners by chance, it comes through working on their development goals in a gradual manner. This includes working hard and searching diligently to gain knowledge (Kinash, Brand and Mathew 2012).

Bloom's Taxonomy is a framework and structure that facilitates the comprehension of the importance of educational tools and methods. It assesses the performance of a certain tool according to multiple factors which have different levels of importance assigned to each one of them. All the levels are interrelated and the succeeding level determines the efficacy (Bloom, 1954). As seen in Bloom, et al. (1956), the use of taxonomy is fundamental for any tool to be useful. The digital taxonomy approach provides a reasonable framework for the assessment of technology. In the case of BBL, its usefulness can be determined by the time taken for the educators and students to reach the most important phase, which is, creating (Persaud, 2018).

The original taxonomy or hierarchy of Bloom consisted of 6 key elements ranked in their order of importance from lower to higher-order thinking skills. The elements are Awareness, Understanding, Solicitation, Examination, Production, and Calculation. Churches (2007) explained the changes and modification in the original taxonomy developed by Benjamin Bloom. He described the role of Bloom's digital taxonomy in assessing the learning objectives and criteria of success for any educational method. Bloom (1954) explained that a concept can only be applied when it is fully understood. Therefore, implementation of BBL at different institutes and higher-level education should only be done after a rigorous assessment and analysis of learning objectives.

All domains of Bloom's taxonomy is very important, however, the most important domain is the cognitive development domain. As mentioned by Churches (2007), Benjamin Bloom the developer of Bloom's taxonomy believed that cognitive development is the key since it is all about the thinking process in which the learner is involved. In addition, the developer of Bloom's Taxonomy (BT) believes that students will not be able to comprehend a new concept without remembering the ideas that came first. Similar to other skills, the learner cannot create and come up with a new concept without evaluating the concept first and then reflecting on it. The first version of Bloom's

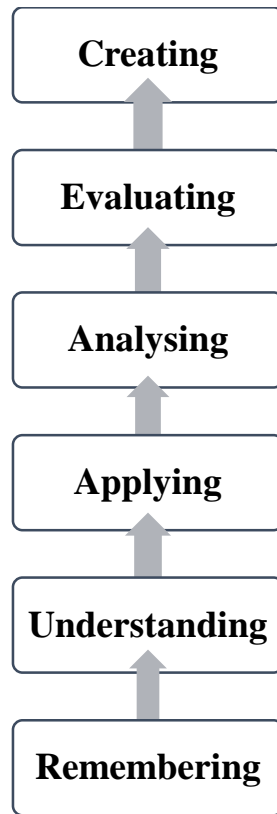
taxonomy believed that the Learner's circle of learning goes from Higher Order Thinking Skills (HOTS) to Lower Order Thinking Skills (LOTS) (ibid). The first version of Bloom's Taxonomy (BT) started with nouns (as shown in Figure 6).



[**Figure 6:** Nouns of Bloom's Taxonomy by Churches 2007]

Bloom's Taxonomy (BT) started with nouns at the very beginning instead of using verbs (as shown in Figure 6). At the time, it started with knowledge, comprehension, application, analysis, synthesis, and evaluation. The lowest order thinking skills was knowledge and the highest order thinking skills was evaluation. Learning starts with evaluation and ends with knowledge. Kinash, Brand and Mathew (2012) mentioned that Bloom's Taxonomy (BT) is the ideal plan for student's learning improvement and it is an ongoing process for learners until they go to the next stage of learning.

After forty (40) years, Bloom's Taxonomy was revised by Lorin Anderson with D Krathwohl back in 1990, one of whom was an old student of Bloom. Then, an official Bloom's Revised Taxonomy (BRT) was published in 2001 as shown in Figure 7. The revisers made two changes to the old Bloom's Taxonomy framework.



[Figure 7: Bloom's Revised Taxonomy]

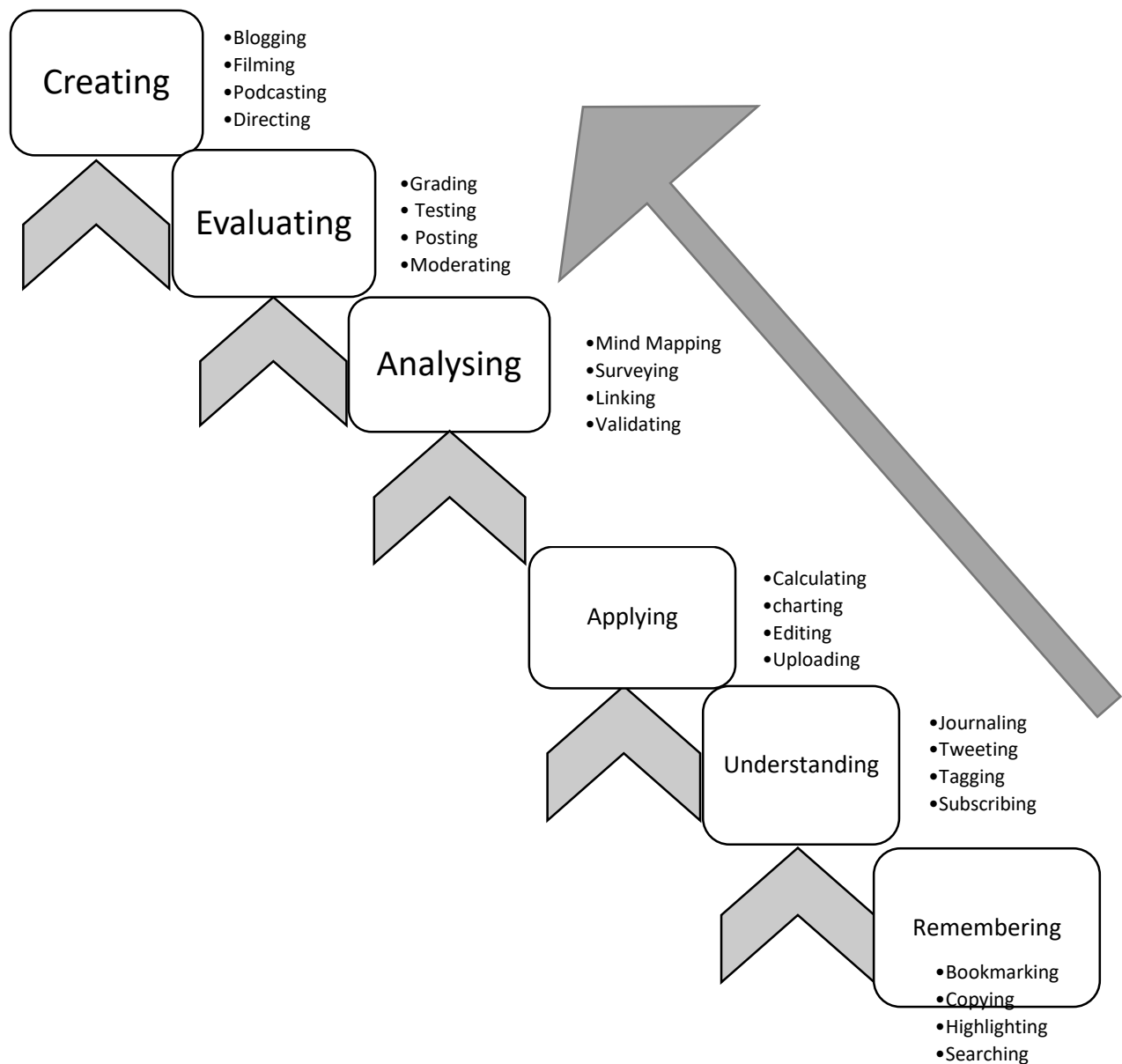
As shown in Figure 7, the revisers of Bloom's Taxonomy rearranged the categorical sequence of the old Bloom's taxonomy (BT). It started from the Lower Order Thinking Skills (LOTS) to the Higher Order Thinking Skills (HOTS). In addition, the main change in this revised version of Bloom's taxonomy was the usage of verbs instead of nouns. The verbs used for revised Bloom's taxonomy are – remembering, understanding, applying, analyzing, evaluating and creating. Anderson and Krathwohl believed that creativity should be at the top of the list.

All the verbs used in Bloom's revised taxonomy covered most of the routine teaching and learning practices in the classroom. But, eventually, technology was introduced in the educational field. Technology does not work by itself without content and tools. Thus, technology should be combined with information and communication under one umbrella concepts which is, ICT. As a result, another update was required for Bloom's Revised Taxonomy (BRT). The elements of the

framework had to be revised in order to address the requirements of ICT to suit the learning and teaching environment of the 21<sup>st</sup> century.

Consequently, the third version of Bloom's Revised Taxonomy was developed. This time it was based on the revised Bloom's Taxonomy and it was referred to as Bloom's Digital Taxonomy. As reported by Anderson and Krathwohl (1990), Bloom's Digital Taxonomy incorporated digital cognitive objectives and digital technologies. In bloom's digital taxonomy the original verbs were kept the same, the changes only included sub-verbs in addition to the original ones (as shown in Figure 8).

Nowadays the use of Bloom's Digital Taxonomy increased and it has attracted significant attention. According to Kinash, Brand and Mathew (2012), Bloom's Digital Taxonomy theory was not that popular and well-received when it was published for the first time. Eventually, the efficacy of the model was established and it was translated to twenty-two (22) different language around the world. Bloom's Digital Taxonomy theory now is the most cited theory in the Educational field and this theory is widely implemented by educators across the globe worldwide.



[Figure 8: Bloom's Digital Taxonomy verbs]

The hierarchy created by Bloom's digital taxonomy can be used to understand the importance of BBL in higher education. The first step in Bloom's digital taxonomy is the remembrance of the required components of BBL (McNulty 2017). Educators and students must be able to remember the keywords or name of the tool required to perform certain tasks in BBL. Fundamentally, it is all about retaining information. Initially, the users can do it through a web search. McNulty (2017) described this as the lowest level in the hierarchy of Bloom's Digital Taxonomy.

The first category in Bloom's Taxonomy is 'remembering' and it has many sub-verbs such as listing, locating, finding, naming, identifying. The verbs in the framework were not added randomly; they were added to describe the knowledge and information with digital additions and their justifications. For instance, in the remembering domain in Bloom's Digital Taxonomy there are digital examples such as social bookmarking (as shown above in Figure 8). The purpose of this action in the remembering stage is to be able to tag the favorites and add bookmarks. Whilst adding bookmarks or highlighting quotes, students can also share them with a team and facilitate a collaborative practice of learning. In addition, students will be able to save pages online rather than saving them on their own device locally.

A total of four skills will be practiced such as tagging a page, saving it online, sharing it and cooperating with a group of students to work on a project. The actions learners can take within the first stage of Bloom's involves following, listing, describing, Googling, social networking, identifying, naming, and locating. Students can perform several digital activities in this stage which includes browsing WIKIPEDIA, mind mapping, blogging, emailing, Facebook and Google search (ibid).

The next step in the sequence is the act of understanding and gaining full knowledge related to a particular operation. Educators must be able to understand the core components and usage of a tool before they can proceed to the subsequent steps. BBL has a variety of tools and each course requires a different combination of these tools. Educators and students do not have to be an expert in all the available tools, but it is imperative that they have complete knowledge regarding relevant tools for e.g. the enrollment function in BBLs Learning Management System.

Understanding can be defined as identifying the meaning of a text or a graph and being able to turn it into comprehensible information. There are some key terms of the understanding stage such as following, explaining, classifying, summarizing, paraphrasing and comparing. The digital actions the learners can perform in the stage of 'understanding' is subscribing. The rationale behind choosing this verb is to take the bookmarking to the next level in different forms. This act will allow the learners to go back to that page and acquire more information to get a better

understanding of a topic. Therefore, once the students learn how to subscribe to a particular web page, they will be able to revisit those pages at a convenient time and retrieve valuable information.

Other possible activities in this stage are watching a video on YouTube and then subscribing to the channel where it is featured. Watch the video again to get a better understanding and then create a presentation based on the video and discuss the facts. Another example in this stage is commenting which involves the student learning how to comment on different documents.

Creating a thread in the discussion board inside the BBL platform, and then commenting on it also qualifies as an activity that facilitates understanding. This is because it allows the teacher to discover the different kinds of elements the students can upload such as a link, a picture or a video. In addition, choosing the appropriate web browser to search is an important task. This may involve choosing Google Chrome over Internet Explorer after observing that that applications and websites would work better on the former. Learners can do advanced searching by filtering as well (Churches 2007).

The third stage in Bloom's Digital Taxonomy is Applying. Applying refers to the ability to implement a technique or system. For instance, using a presentation or model or video to learn specific concepts. Examples of the digital verbs that are applicable for this stage are the following – editing, sharing and uploading.

All students need to learn how to edit the media. Learners can practice this skill during their research, presentation or homework. In addition, the justification behind uploading documents and sharing materials is that it will help students attain higher-order skills like teamwork thereby allowing them to collaborate with others using the same platform. The keywords that can be used in this stage is implementing, loading, hacking and executing. All the possible activities that can be done with learners in this stage is interviewing or meeting people via Skype, using online educational games and, editing using moviemaker to edit pictures or videos by adding sound and text (Churches 2007).

As mentioned earlier, the third tier in the hierarchy is the Application. It is the capability to employ the knowledge according to its desired use. BBL can be used for many different purposes for higher-level education. The application of its tools is dependent upon the remembrance and understanding of its users. According to McNulty (2017), an application like delivering a lecture online requires the teachers to remember keywords and their understanding in the context.

The next level of the hierarchy is the Analysis of digital platforms (Wedlock and Growe 2017). This requires establishing links between different components and having the ability to use them together. For BBL, instructors must have the ability to analyze multiple tools and functions and choose the most beneficial one for their students. In addition, students need to learn how to analyze the online source available for them.

Example verbs of the fourth skill in the Bloom's Digital Taxonomy that the teachers can use are – linking, cracking, mashing, outlining, comparing, structuring and organizing. The academic definition of analyzing is dividing a whole concept into parts to facilitate better understanding. Sometimes the parts of a concept can be connected and sometimes it is difficult to comprehend.

The justification for choosing to link as a verb for the analyzing stage can be explained by the ability to create links with the document offline and online via the website. In addition, many information sources can be integrated into one source. Cracking refers to the ability to evaluate a system or an application to identify the strengths and weaknesses and then analyzing them to have a better understanding. A possible example for this stage is preparing a spreadsheet using Microsoft Excel and then analyze the data or conducting a survey using tools such as survey monkey and then analyze the graphs (Churches 2007).

The fifth stage in Bloom's Digital Taxonomy is evaluating. There are a number of activities associated with this stage like validating, testing, collaborating and moderating. Nowadays there is a wealth of information and knowledge available for students both online and in books. With these unlimited sources, students should be able to make some judgments, evaluate and analyze the sources to check the authenticity and validity of the data.



Testing is a vital tool in evaluating as it helps the students to try out the tool thereby enabling them to recognize how it works. Furthermore, collaborating, which is an enormous element in the education field, emphasizes the importance of communication skills. This has become an essential skill in the 21<sup>st</sup> century since it focuses on collaborating and networking.

Moderating documents is a very important practice in evaluation since it helps the moderator to evaluate the document, ascertain its importance, relevance and suitability. Possible activities students can do in this stage is to take part in a debate in the live virtual classroom using Collaborate Ultra in the BBL. Students can also engage in a productive discussion on a particular topic through a conferencing call over mobile devices (Churches 2007).

The last stage in Bloom's Digital Taxonomy is creating. The meaning of creating is joining elements together to come up with a new structure. The key verbs that can be used in this stage are – filming, programming and publishing. In filming, the students should be using multimedia to capture, modify, and mix media information to deliver a new and unique product. Whilst in programming the students should develop an application or a game that can fulfil their own needs. As far as publishing is concerned, students can publish their pictures or even video. It is imperative that the content be revised and prepared in a professional manner and this can only be done through a proper understanding of the procedures of publishing. Possible activities students can do in creating stage is create an online game using this online tool 'Game Maker' to come up with an exclusive game that suites their wishes (ibid).

According to (McNulty, 2017), creation refers to the ability to use past knowledge and experience to create a new product. Applying all of these stages to any operation of BBL can help in understanding its importance.

The educators and teachers must be able to follow the procedural steps identified by BDL and create the desired outcome for e.g. an online presentation. Laufenberg (2014), highlighted the importance of education in the digital era. She mentioned that information is extensively accessible and handy because of the advent of the internet. She criticized the prevalent systems of education and emphasis on grades. According to her, a student learns better when he fails and embraces his

mistakes. Therefore, the aspect of experiential learning is of utmost importance in the application and use of BBL. Assessment and evaluation are necessary for prolonged and efficient use of BBL. Educators must understand the taxonomic approach and gain sufficient technical expertise to use the learning tools and models of e-learning.

### **2.3.2.3 Connectivism Learning Theory (CLT)**

Shifting the traditional ways of learning to remote online learning require the application of new online theories such as Connectivism Learning Theory. This theory was conceptualized back in 2005 by George Siemens and Stephen Downes (Bell 2011). According to Goldie (2006), there are plenty of online learning theories available for educators and a number of them have been improved and revised in order to be relevant for the current digital environment. However, the most noticeable online Learning Theory is Connectivism Learning Theory.

The first time Connectivism Learning Theory was acknowledged, it was by a medical educators team (Goldie 2006). Basically, Connectivism Learning Theory can be defined as Learning Theory that is designed for the digital learning environment. As reported by Bell (2011), even though Connectivism Learning Theory was discussed in plenty of previous researches, it is an inadequate theory and, therefore, not enough to function alone. However, it is massively known worldwide and it supports digital learning and technology implementation. But, researchers believe that it Behaviourism must be supported with other educational theories.

Connectivism Learning Theory is a backup and background of the broad and old educational theories such as Behaviourism, Cognitivism, and Constructivism (Bell 2011). The Connectivism Learning Theory was criticized by many researchers as they claimed that this theory is trying to dominate and replace the previous theories and lead the learning theories in the educational field.

There are a number of philosophies that forms the basis for Connectivism Learning Theory. For instance, based on Connectivism Learning Theory, learning and gaining knowledge can come from different sources. In addition, knowledge gain can happen via connecting individuals with a variety of online sources. The most interesting aspect of Connectivism Learning Theory is that it helps in

expanding the capacity of learning within students thereby encouraging them to get full advantage of any learning opportunities. This theory suggests that everything an individual has learned in the past is less important than what is being learnt at the moment because the information is updated and accurate.

Based on this theory, the users should keep communicating online because it helps them to continue learning. The connection between the components such as thoughts, information and sources is a key skill in Connectivism Learning Theory. In addition, finding the latest information is essential in Connectivism learning activities as mentioned earlier. Last but not least, the principal in this theory is decision making. Connectivism- Learning Theory teaches the users to improve the decision-making skills by choosing the type of information required, the source of the information and the web tool they want. These decisions taken whilst researching, influence and improve learning. (Bell 2011).

Some educators argued that Connectivism Learning Theory is not a theory, and it should be considered as a phenomenon. In addition, it has been argued that Connectivism Learning Theory has a number of guidelines, techniques and expectations that have been used in order to find the desired results. Intellectual and knowledge discovery guide this theory. This argument has been denied by other educators, as they believed that this theory allows students to connect and find the knowledge and practice reasoning by linking this theory with previous educational theories.

Lastly, Connectivism Learning Theory has been described as a theory that enables people who are using technologies to validate the process of learning and teaching. Technology gives the faculty and the students a golden opportunity to utilize good practices of learning and teaching (Bell 2011). This is similar to BBL which also allows users to choose the type of information they will use and practice.

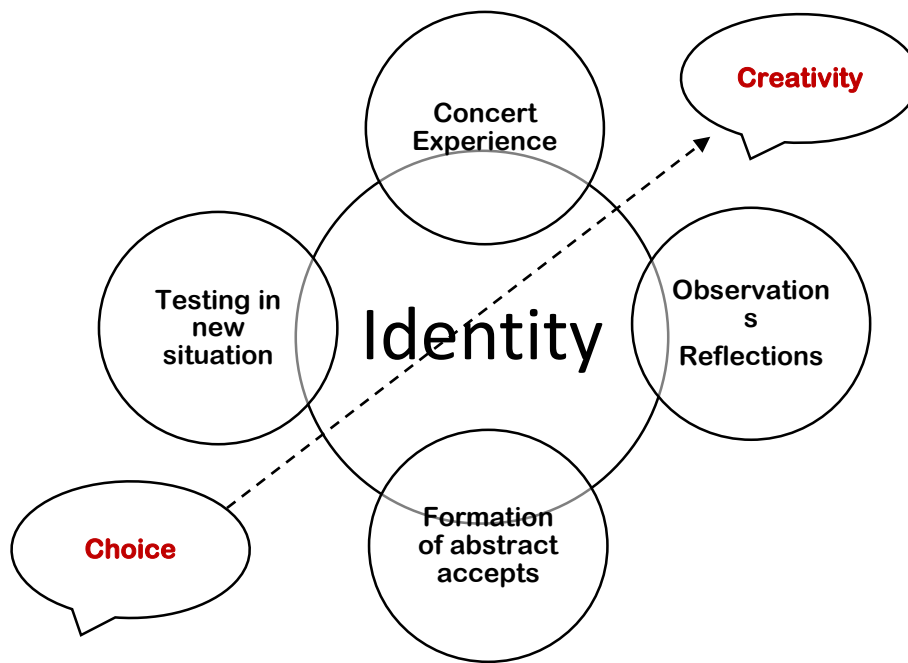
In the 21<sup>st</sup> century, teachers should use digital tools and technology. As stated by Luoju and Vilkkii (2010), the Connectivism Learning Theory is a theory for 21<sup>st</sup>-century digital education. The Connectivism Learning Theory overcomes all the borders and limits of the previous theories of constructivism, Behaviorism and Cognitivism. As mentioned earlier, this theory was debated over

a long time to approve it as a Learning Theory or instructional theory or simply as an academic educational perspective.

The new generations learn through high standards of educational technology besides instructions given and content covered (Luojus and Vilkki 2010). As technology is the core of learning and teaching, this theory unquestionably worth considering. The most important element in a theory is that it gives good explanations and provides information about behaviors. Most theories are revised, developed and they can get a new direction. In addition, the theory should be tested many times to ensure that it would have valid and reliable results. Theory can be defined as a big blend of information and typically are of two type – instructional theory and Learning Theory.

Instructional Theory can be defined as the prediction of the actions taken to ensure efficient and effective learning. Four main factors must be available in the Instructional Theory. The first factor is the students' willingness to learn. The second factor is the information design, implying that information should be prepared in a way that makes learning easier. The third factor is being able to present the content and the body of the curriculum content since good curriculum presentation is the most successful aspect. The last factor is making the list of rewards and punishment clear for students. Thus, Instructional Theory targets the whole construction, organization and arrangement of learning resources in order to offer the best learning practice for the learners and teachers. In addition, Instructional Theory can assist the educators in coding the learning method and then developing it (Luojus and Vilkki 2010).

Connectivism Theory can be considered as a Learning Theory for many reasons. First of all, educators found Connectivism Learning Theory to be effective in boosting students' knowledge and it enables learners to gain additional networking skills and improve their personal skills. The students who search and find many points of views online can read more and decide which sources of information relevant to their work. This process can be linked with the improvement of collaboration skills in order to work with other peers in the same project. The internet provides enormous databases of information that the students can view using one tap only. This practice empowers the students to search for further information and be interested to know more about the topic (as shown in Figure 9).



[Figure 9: Connectivism Learning Theory]

The Capability to gain information and seeking knowledge could ease research and enable the researcher to understand the variable patterns. Explaining the learning theories via the old and traditional theories will provide a limited rationale of learning especially in the current situation where technology took over and all local services are offered using the most recent technology. As a result, Connectivism Learning Theory refers to the students' actions experience. In this experience, the students ought to identify where to find information. This aspect is more significant than how or what information is found. When the traditional theories of education such as Behaviorism, Cognitivism, or Constructivism are compared with a new theory like Connectivism, many common ideas between all the old and the new ones were observed. Thus, all educational theories are connected and there are no boundaries between them (Luojus and Vilkki 2010).

Connectivism Learning Theory is not a newly developed theory. All broad theoretical approaches and theories have been developed and revised many times in order to be relevant to the current times. Connectivism and Cognitivism have many aspects in common since both are linked with how people think. According to Luojus and Vilkki (2010), 'Connectivism can be used as an

important instructional guide or theory to develop previous learning theories for their application to a globalized and networked world, but not as a standalone Learning Theory' (p. 9).

The Connectivist Learning Model (CL) is shown in a graphical design as presented in Figure (8). As shown above, it started with a choice of online source, then it goes through identification of knowledge and at the end, it leads to creativity. During that process, users are learning new concepts, observing and reflecting on new concrete experiences and identifying new strategies and at the end, thus gaining new knowledge.

Knowledge is defined as a “persisting change in human performance...” by (Driscoll, 2000). The theory of Connectivism in learning is the application of different theories that are interconnected. Different theories are linked together based on a common underlying theme to understand the impact and usefulness of certain component (Siemens 2004). Since it is an integrated theory, it depends upon many factors and perceptions.

There are certain fundamental grounds for the theory of Connectivism. It dictates that the learning takes place through diversified ideas and concepts. BBL offers tools for social interaction and discussion between educators and students. This allows them to share and discuss ideas. A one-way model of teaching is not as productive and violates this fundamental of the Connectivism approach.

Connectivism Learning Theory considers the decision-making phase as an opportunity to learn and experiment (Siemens 2004). Older theories like Behaviourism and Constructivism cannot be used to understand the importance of BBL or any other digital tool. This is because they originated in a post-digital world. On the other hand, Connectivism Learning Theory is a very useful theory for an impartial and unbiased analysis.

Many educational institutes and universities face difficulty in database management and storage. The Connectivism approach guides that all such knowledge must be made accessible to the relevant people and they should feel a sense of connection. Kop & Hill (2008), described the learning process as cyclical which requires a continuous flow of information. Applying the

principles and framework of Connectivism Learning Theory on BBL shows that it enables connectivity and establishes a link between the knowledge providers and knowledge seekers.

The importance of BBL can, therefore, be understood in the broader sense through Connectivism Learning Theory. Referring to Gredler's (2009) criteria of four requirements of a Learning Theory on Connectivism, it can be said that the theory can be used for learning because it provides a clear and concise set of beliefs as mandated by Gredler (2009) (ibid).

Connectivism theory also emphasizes the importance of a streamlined information flow. Siemens (2004) similarly discussed the aspect of creating and understanding information in an organization. BBL architecture provides a reasonable basis for the storage of information and its distribution to the relevant stakeholders. Therefore, the importance of BBL can be assessed by its application and fulfillments of aspects in the Connectivism Learning Theory.

### **2.3.3 Broad Review of Learning Theories**

In this part, the broad theories of the study will be discussed. A total of two broad theories were selected for this study including – the Zone of Proximal Development and Scaffolding and Activity Theory. All details will be discussed in the following sections.

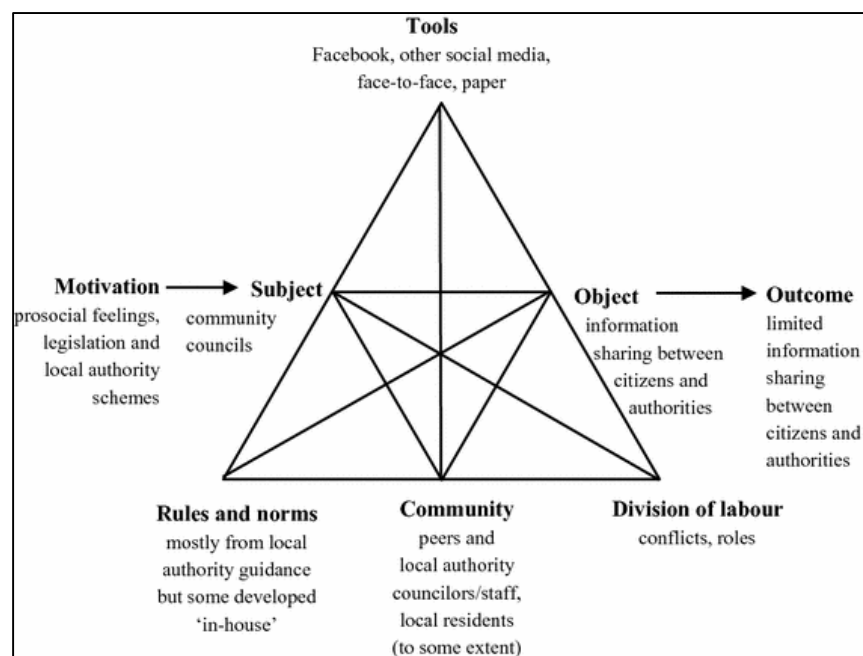
#### **2.3.3.1 Activity Theory (AT)**

Activity Theory (AT) was created back in the 1920s by Vygotsky, Leont'ev and Luria. This theory is based on description rather than prediction. Heath and Pea (1999), on the other hand, Brown, mentioned that the Activity Theory first appeared between the 1980s and 1990s and it was internationalized at that time.

Nardi (1996), stated that the main focus of Activity Theory is a daily practice. The Activity Theory can be defined as a dominant tool that is used for describing and explaining actions (Nardi 1996). The core purpose of the Activity Theory is to clarify the awareness of activity. As a result, this

theory is all about the introduction of an individual. Simply it is the analysis of the activities performed by individuals. The Activity Theory believes that people perfect definition is their own behaviors and acts. In addition, the Activity Theory can be described as a realistic theory since it relies on a cultural and historical basis (Kaptelinin and Nardi 2006).

The Activity Theory is designed to examine the human activity system through two aspects – the socio-cultural aspect and the socio-historical aspect (Roth 2009). The Activity Theory concentrates on human’s communications and human’s perceptions. All these aspects are supposed to be linked with the environment background. The Activity Theory is practical for education due to its perfectly functioning in the education domain. Another key terminology in this theory is the frequency (ibid). Whenever people perform an action more frequently, they tend to do it differently every time. Besides, each time they repeat it and they do it better. The most important elements in the activity are – rules, subject, tools, community, object, outcomes and division of labour. The Activity Theory model is shown below in Figure (10).



[Figure 10: the tools used in the Activity Theory (AT) by Coleman and Coleman (2013)]



As shown above, in Figure 10, the Activity Theory is based on the notion that older individuals stay happier and live longer if they maintain social interactions. It is a widely acceptable contemporary theory that has guided the core aspects of ageing (Loue et al., 2008). In the digital world, the Activity Theory is applied to accomplish tasks and objectives through mutual cooperation and properly built structure.

The Activity Theory was described as a collective work activity. Work or tasks are divided on the principles of division of labor. Every individual has a specified task and duty in the organization (Brown 2011). This enables workers to become specialized and skilled in their work. The tasks are coordinated and linked such that everyone is recognized and rewarded for the work that they are doing.

The gist of this theory is that stakeholders utilize internal (cognitive abilities, mental skills) and external (tangible and intangible) tools to achieve their objectives (Anon 2020). For instance, students using their knowledge and online tools like e-library to pass an assignment. This theory is applied widely in the education and preparation of curriculums. The aspect of external tools dictates that the interaction between faculty and students is accomplished through the relevant media.

In a traditional education system, different objects like chairs, tables and classroom board act as a mediator and establish a link between the members. It allows them to retain knowledge and memory associated with the furniture. In a virtual classroom, objects are intangible and often much less influential. This is one of the major criticisms of remote education. Digital education does not allow students and teachers to interact through a physical object. However, hybrid models and blended learning models can minimize the impact of this problem, but its ineffectiveness cannot be overcome completely (Engeström, et al. 1999).

Many theorists and researchers have established the link between knowledge and context. The Activity Theory strengthens this link. Learning through experiences and association is much more profound and the students can retain the knowledge easily. Similarly, faculty members and

teachers can learn through discussions and the association of objects which influence and aid their discussions. All of these objects are present in the context of a traditional classroom (Billett 2003).

Even for higher-level education, the application of Activity Theory remains the same. Students are expected to learn and retain if they have any experience of the surrounding. According to Billett (2003), this experience includes the ambience, environment, objects in the classroom and objects used for teaching. Applying this core principle to BBL's online teaching methods provide a pragmatic view of the realities in online learning and remote education.

Object association is not possible in virtual classrooms or online presentations. As a result, the retention of students in the long term is affected. BBL and other remote education facilities also fail to provide social interaction and integration to the students. Loue, et al. (2008) argued that this coincided with certain aspects of Aging Theory. Students will experience isolation and seclusion because of reduced social interaction and the application of knowledge acquired from blended models will be flawed (Griffiths & Guile 2003).

All blended models are required to have a degree of connection and activity. Said, et al. (2014) provided a model for the application of Activity Theory in online learning models. This is dependent upon tools that influence the participants and determine the outcome of the learning process. The second generation of Activity Theory provides a useful relationship between Rules, Subject, Community, and Division of labor and mediating tools with the end product.

In the case of BBL, rules are the recognized boundaries, and the standards are guiding the online systems. All stakeholders involved including the students from the subject. Community is the whole class or group using the learning tools and division of labor can be referred to as individual inputs of the students for any activity. The concept of the mediating tool has changed and transformed because of e-learning. Virtual tools can also be used to understand the progression of activity in a process (Said, et al. 2014). Therefore, BBL can be considered a useful and important domain for online learning and education. However, the conventional application of Activity Theory considers distant education as a vacuum (Boer 2002) and the system of activity cannot be applied in that context.

The rationale behind the implementation of the Activity Theory is that this theory focuses on tools like computer, iPad and smartphone. It highlights the relationship between the human and its device. The roots of Activity Theory started back in the 1930s in the Soviet psychological Activity Theory established by Sergei Rubinstein. The Activity Theory has some points in common with Vygotsky theory. Educators considered the framework of this theory as something more than just a predictive theory (Waycott, Jones and Scanlon 2005).

The Activity Theory is very effective in educational institutions as well as health institutions. Using and investing this kind of ICT in healthcare will pay off and improve the services provided in the medical centers and educational development (Coleman and Coleman 2013). On the other hand, Hung et al. (2009), argued that the Activity Theory is functional also in a business institution as it enables individuals to exchange knowledge and experiences through their actions. Furthermore, it is functional in information communication technology as shown in Figure (10). This Figure displayed the ICT tools that can be used within the Activity Theory. Facebook or any type of social media, paper-based tools and face-to-face tools can also be used within the purview of Activity Theory.

The Activity Theory (AT) is an evocative instrument and framework. In this framework, what matters is the fact that students belong from two different points of view, culturally and socially. However, Smart devices and system mechanisms do not matter. This contradicts the aforementioned information. In this theory, there is a number of arguments based on the analysis of the level of human activity and their motivation is based on a ranked analysis. This theory reflects on the individuals' work or activity system as well as the groups or organizations. Many elements impact the Activity Theory (AT), for instance, the individuals' surroundings, past, level of enthusiasm, and the real-life difficulties each individual has experienced (Kaptelinin and Nardi 2006).

The idea of the Activity Theory is also embedded in providing the framework to justify how a group of people are influenced after a physical and virtual interaction during the implementation of any activity (Hung et al. 2009). In addition Liaw, Huang and Cheng (2007) clarified that the

Activity Theory is the most appropriate theory to comprehend the e-learning approach and to understand people's attitudes towards digital experiences.

Another model of the Activity Theory known as the Engestrom's Model can also be used. This model mostly focuses on the artefacts presented by individuals. In addition, this model clarified for the readers or implementers in understanding how many elements can affect a human's activity, such as, community, rules enforced, subjects taught, artefacts and division of overall efforts to support the education process (Kaptelinin and Nardi 2006).

There are three stages of the Activity Theory that it may go through randomly. The first one is answering the question of 'Why'. This activity is created to achieve a goal planned by the public. This goal may not be based on social or particular individual purposes yet it is a result of a necessity. The second stage of the Activity Theory is a mindful and particular goal. It answers the question of 'What'. This mindful and particular goal is planned by a number of people in an organization or an individual to set a number of goals and sub-goals as well. The goals should be thoughtful and accurate. The third stage usually answers the question of 'How'. It tends to set an automatic goal and not a solid one based on the prevailing situation and environment.

There are four principles of the Activity Theory. The first principle of the Activity Theory is that it is an object-oriented theory. The object orientation should not be a software design type. It can possess varied properties like social orientation, cultural orientation and natural science. The second principle is internal activities and external activities. Both internal activities and external activities cannot be performed independently. As a result, both activities are complementing one another and facilitating its movement to the next level. Internal activities allow people to interact with reality without the need to use and handle actual objects such as visualizing dreams and goals, mental recreations, etc. External activities are vital when the internal activities are ought to be modified, fixed or scaled. In addition, external actions are important when there is a need for collaboration between multiple people (Kaptelinin and Nardi 2006).

The third principle of the Activity Theory is mediation. Tools used for a broad array of functions mediate the people's activities, and this is what the Activity Theory highlights. These tools can be

gained, created, developed and transformed to people whilst the activity development. It moves with special, cultural and historical concepts that are aligned with the activity development. Thus, tools usage is a great way to build up and exhibit social development. In addition, the tools used can also impact the external behavior and the mental developments of its users (Kaptelinin and Nardi 2006).

The fourth principle of the Activity Theory is development. Development is not a basic and normal element of the Activity Theory. Development of the Activity Theory is a serious research methodology. Formative assessments and practices are the basis for the research methodology in the Activity Theory. This formative experience includes the individuals participating and their improvements and changes. In addition, a method is implemented in the Activity Theory which is the ethnographic approach. This is implemented since it tracks the individual's improvements and their history and this method is a core aspect of the current studies (Kaptelinin and Nardi 2006).

### **2.3.3.2 Scaffolding and Zone of Proximal Development (ZPD)**

First of all, ZPD stands for the Zone of Proximal Development. Individuals and independent learner's scaffolding is linked with Vygotsky's theory which is Zone of Proximal Development (Guk and Kellogg 2007). Many teachers found difficulties in implementing the ZPD on account of the need to teach the whole class in the public school. As a result, most of the teachers ignored the concept of ZPD and prefer working with students individually during normal lessons. In addition, Nordlof (2014) believed that the Zone of Proximal Development theory explains that socializing with others is the first step of learning. This, in turn, allows the learners to adopt the principles of the theory.

Lev Vygotsky described scaffolding as the act of seeking help from someone more experienced or qualified (Morgan, 2009). Zone of Proximal Development is a precursor of the scaffolding theory. It suggests that children are likely to perform better with little assistance and help from adults. Both of these theories were popularized and presented by Lev Vygotsky. He wrote extensively on early child development and factors influencing a child's performance. In the digital era, his

theories are used to enhance all levels of education through experiential learning and social interaction.

The application of ZPD has been argued by many researchers. The application of ZPD was described as a spectrum of learning (McLeod 2019). A child or student possesses three areas of knowledge. There is a known area that is accessible to the child and he/she can apply it individually. The second area is the unknown or inaccessible region of knowledge which the child or student cannot access. In between these two regions is the Zone of Proximal Development, which is accessible for the child but they need a little help or assistance from their peers or instructors (Shabani, et al. 2010). The three aspects must be explained together to form a comprehensive understanding of this theory.

Scaffolding refers to the help provided by instructors or students to their peers to assist them through their Zone of Proximal Development (Wood, et al. 1976). Vygotsky used the two concepts to emphasize the usefulness and importance of social interaction in the education and development of children. In higher levels of education, his theories can be appropriately applied for understanding the importance of context and scaffolding on learning outcomes.

Applying the theory on distant learning can help examine its flaws and benefits. Online learning can be scaffolded by the faculty in various ways as identified by Jumaat & Tasir (2014). They mentioned four (4) main ways of scaffolding in virtual classes and remote learning. Firstly, Procedural Scaffolding refers to the assistance provided to students in learning the online applications and tools. Secondly, Conceptual Scaffolding refers to the assistance to a student in core concepts and essential knowledge of the course. Thirdly, Strategic Scaffolding is also possible in an online setting. It refers to the guidance and assistance provided by teachers to help students deal with problems and issues. Lastly, Metacognitive Scaffolding assists the students in self-assessment. Jumaat & Tasir (2014) mentioned such ways in which scaffolding can occur in online learning and the students can be helped out of their Zone of Proximal Development.

Application of Scaffolding and ZPD theory on the BBL system is also important in the assessment and analysis of its usefulness. Conceptual and procedural scaffolding is possible in various

facilities of BBL. Students can be assisted in virtual classrooms or online presentations. However, metacognitive scaffolding is not always possible. Guiding students to plan and structure their work and help them to think in the right direction is much more complicated in the virtual classroom system (Caruana 2012).

BBL's learning platform is built to allow interaction between peers with facilities like peer-review assignments. It also allows scaffolded learning by the instructors through its SIS integration, virtual online classrooms and online group discussion. The portals of BBL also facilitate collaboration and review of work by the instructors and students as well.

The theory of scaffolding can, therefore, be used to understand the impact of BBL and other learning modules on student's learning and development. BBL is important from a faculty's perspective as well, because it allows them to interact with students and use their expertise and knowledge for supervision and guidance. The process of scaffolded learning is different in distant education from traditional systems, but a comprehensive structure has facilitated its adoption by the instructors.

Guidelines are essential to support the students and scaffold their learning. Anon (2020) provided guidelines for instructors at the University of Kansas to scaffold their students and assist them in learning. Its guidelines to the faculty consist of early login to online classes and portals, checking e-mails frequently, following the timetable etc. Such guidelines are extremely important to ensure scaffolded learning in an online or blended learning model.

## **2.4 Theoretical Standpoint**

The literature review was conducted to comprehend the significance and impact of online learning tools provided by BBL. The historical origins of remote education and BBL were examined and reviewed for the proper understanding of e-learning's current and future potential. An application of prevalent theories and variables on the literary sources and available data of BBL revealed its pros, cons, and the factors affecting its sustainability.

BBL remote learning system has assisted the transition from traditional systems of education to distant learning. Perceptions of the faculty were also examined through available literature. Skepticism and reluctance of faculty to shift towards virtual education are well-documented through the previous empirical studies. Over the course of this literature review, the faculty's main concerns and issues were gathered as well. The main issues were identified as increased workload and lack of technical expertise while using online tools such as BBL and Collaborate Ultra.

The application of theories on the impact and significance of BBL proved vital to the research and findings of this study. Learning theories like Technological Pedagogical Content Knowledge theory (TPACK) and Digital Bloom's Taxonomy can be used to understand the required procedure and steps for implementation of BBL in higher levels of education. Object-oriented theories like Connectivism Theory and Activity Theory also highlighted the shortcomings and problems associated with digital learning. In order to generate a sustainable digital learning environment, it is important to use the recognized practices and procedures of these theories and concepts.

BBL must also facilitate all kinds of scaffolding at different levels of education to enable both the students and faculty's development and growth. Furthermore, the Technological, Pedagogical, and Content-based Knowledge (TPACK) framework must be used to analyze the practicality of using BBL for courses and programs. As a result, this theory has the three-pronged approach of TPACK considers all aspects of learning and knowledge. To sum up, management, faculty, and students must collaborate and work together to make important decisions like the use of the learning model for education.

All academics and technologists already knew BBL did not stand up in a vacuum (Whitmer, Nuñez, Harfield and Forteza 2016). Instructional goals of the course and its framework in BBL is the main target. Taha (2007) cited that despite all the advantages of BBL, there are a number of drawbacks. A previous study conducted at the UAE University 'UAEU' found out that e-literacy is a key aspect to allowing users, either faculty or students, to adopt and accept e-learning approaches in the higher education level in the United Arab Emirates (UAE). However, the most prominent barrier is the language used for teaching and communication. There are many languages around the world and they are not fully supported in the BBL system and one of these languages



is the Arabic language. Blackboard Learn does not support the Arabic language in its platform and its interface (ibid).

In the domain of education and research, a framework called a service-oriented approach (SOA) is used in BBL. This framework has multiple aspects, the first aspect is based on technology adoption. The second aspect is based on the environment adaptation in order to get an overall beneficial experience for the users (Narwani and Arif 2008). As per the opinion of Gornitsky (2011), distance learning and BBL provide more knowledge opportunities for faculty and students. It assists the users either faculty or students to work in a diverse learning environment with larger groups of people.

Regardless of all the accessibility BBL can provide for users, one group of users can face many barriers and challenges in using BBL as a learning and teaching tool, especially in distance learning, and that group of people is users with disabilities. Users with disabilities need more technologies assisting the use of BBL to complete their work. However, distance learning is the best way of learning for disabled people as it is appropriate and flexible.

The importance of spreading awareness regarding the responsibility of individuals' learning process, among faculty and students is undeniable. The faculty should educate the students to take full advantage provided for them in the BBL platform. The youth is an extremely critical demographic in the community life cycle. In addition, BBL promises to provide help for the users to improve soft skills too. Furthermore, previous studies showed that a teacher who has a good understanding of the BBL and its uses exerts a positive influence on the students and provide a better learning experience for them (Dwivedi, 2012).

Learning outcomes from the literature review were that the use and effectiveness of remote education has remained a continual debate since the inclusion of technology in education. Its application to higher and advanced level of studies was questioned and criticized by decision-makers and stakeholders. With the spread of technology and bridging of gaps in terms of physical distance and technical know-how, colleges and universities transitioned towards the online

learning models and tools for education. This was used to compare the impact on student's performance before and after the shift.

The perceptions of faculty members in different eras of the digital world also showed a drastic change in attitudes towards remote education. Problems and issues in online education were identified and solutions were proposed in the light of learning theories. Learning theories like Technological Pedagogical Content Knowledge (TPACK), Digital Bloom's Taxonomy (DBT), Connectivism Theory (CT), Activity Theory (AC) and Scaffolding and Zone of Proximity Development (ZPD) were applied to the available framework and analysis of literature.

The results showed a degree of variation in the importance and practicality of BBL from the faculty's perspective. Its importance in learning and teaching is directly connected with the fulfilment of learning objectives and outcomes. Therefore, the remote or distant learning methodologies must only be applied if the conditions and requirements are met. Ertmer (1999) noted that nowadays teachers can clearly notice the importance of technology integration into their curriculum. Nevertheless, more preparation and training is required either for pre-service teachers or in-service teachers.

## **2.5 BBL as an Emerging Platform in Higher Education**

In this part of the study, all important topics in relation to BBL will be discussed in the following sections. This includes the Blackboard description, the role of BBL in teaching with faculty, the role of BBL in learning with students, BBL and remote learning, the history of BBL and the use of BBL in higher education. Perceptions of BBL around the world, professional views towards the use of BBL, the future of BBL and the other digital tools that can be used in higher education as ICT are also discussed in the following sections.

### **2.5.1 Description of BBL**

BBL is an online application that offers users virtual teaching and learning, it permits users to make a community and share information with other users (Blackboard 2020). In addition,

Patterson (2013), agreed that BBL can be defined as a virtual community. Furthermore, BBL is a freeware, software and platform that is used in many institutions worldwide and it is a tool of Web 2.0.

Plott (2010) highlighted that education is shifting globally now, from traditional ways of education to using mobile devices in education. In addition to that, education is shifting to develop a learning management system to keep the learning and teaching circle in perfect synchronization. Otherwise, education will be hampered and the students will be disadvantaged. Thus, to keep education up, institutions should provide good software to make this process possible.

In line with Patterson (2013), some users who are using the BBL for the first time find this platform to be very complex and overwhelming. Plott (2010) mentioned that BBL is always the first and the top selection for educational platforms. It was stated that with BBL technology, the faculty productivity has been seen to increase as they are taking full advantages of the BBL features to develop teaching methods.

Bradford, et al. (2007) stated that BBL offers commanding, straightforward structure, the interaction between student and teacher, and assessment generators. On the other hand, the Technology Issues Committee doubted some applications of BBL systems such as the hybrid courses, the supplement that support the courses and other developments on the system (Bradford, et al. 2007).

According to Littlemore & Farmer (2014), findings from a blended course offered using BBL showed that students who are using BBL and engaged in a blended course found the course beneficial and entertaining. On the other hand, the same study showed that students found face-to-face courses were more useful than blended courses (Littlemore & Farmer 2014). In addition, they assumed that the most important feature in Blackboard was the facilities used in this tool for instance the course announcements, the discussion forums, and the grade book setup and weighting. Janabi-Sharifi, Wilson & Pang (1993) claimed that with the increasing development of mankind, technology will grow, and an increasing number of smart systems will be needed. Building smart systems is not an easy task as it will lead to a variety of difficult tasks that need to

be addressed such as, acquisition, employing and training specialists of the system for testing the smart system and updating it on a regular basis.

The most commonly used tool in higher education is BBL. BBL is a free application and an online web-based tool. It can be accessed either from mobile devices, tablets, desktops, or laptops. This digital tool provides an online sharing content platform. It can be used as a learning management tool, marking tool, as well as an interactive tool. BBL offers virtual online meetings and lessons via Collaborate Ultra (CU). In addition, this tool is a faculty and student-friendly tool.

BBL can easily generate announcements and e-mails them to the students instantaneously. Faculty and students can write comments and share knowledge through the platform. In addition, faculty can upload content and arrange it based on their preference. Students can download the course materials easily through one click and similarly upload their assessments and homework on the platform. All of the quizzes and final exams in this higher education institution are designed using BBL.

BBL is an online integrated learning solution that provides software for educational institutes. BBL supports traditional teaching as well as remote learning practices. It started its business in 1997 when two companies of Course Info LLC and Blackboard LLC combined their operations and formed Blackboard Inc. Together, it developed online architecture and systems to assist faculty and students. It offers Enterprise Resource Planning (ERP) and Learning Management System (LMS) to facilitate multiple teaching avenues.

BBL allows institutes to store student data, integrate and communicate with them. Various activities like online quizzes, assignments are also conducted on the web-based portals designed by BBL (BBL 2020). The company has successfully catered to its diverse customers and used a flexible approach to implement its software and safety protocols. Every institute requires a different set of learning tools and it differs greatly in nature and size. This is why BBL's architecture and software are kept flexible and can be scaled according to the requirements of institutes (ibid).

In general, BBL does what it intends to do, that is, allowing the faculty to use it as a remote online tool by uploading materials, interacting with students, and grading assignments. However, the faculty and students have complained that BBL does not have an engaging layout. They argued that the interface of BBL is not fresh, new, and updated. Besides, they have claimed that there is a need to add some features like dynamic menus, new fonts, and eye-catching visuals (Guler 2020).

BBL users occasionally argue that it is hard to find and navigate the important information that the faculty or students are looking for. In addition, some students cannot find the assignments' locations and they argue that BBL sometimes could be tedious to use. BBL can be very tricky in navigation especially when the faculty uploads numerous items and documents in the course. When the course consists of a myriad of materials and documents, BBL becomes very slow, making it difficult to navigate (Cluff 2020).

It would be great to gain access to similar courses, resources and teaching materials, in addition to those materials provided by the faculty in the course. Access to materials from varied universities around the world could enrich the learning experience. As uploading course materials is a core role in BBL, some faculty do not upload enough materials for the students and they tend to explain everything during the lecture itself. Some faculty needs more resources to enrich their courses with different materials. The faculty and students should have an access to search and find extra resources based on each course from varied universities around the world to make this experience beneficial (Hanhan 2020).

BBL has basic teaching and learning features. Faculty and students need an updated version of this tool to cope with the 21st-century skills learning experience which includes, instant chatting between faculty and students. Instant chatting allows the faculty and students to conduct an immediate discussion on a certain topic. In addition, one of the limitations of BBL is that it lacks an audio feature. Faculty and students sometimes need to engage in audio/voice recording for certain assignments. Visuals are a key component in the current scope of learning, so adding icons for the file names instead of lengthy titles would be valued by both the faculty and the student (Harris 2019).

Remote education and online learning models have greatly impacted the nature of education in the modern world. Hybrid models of education including a combination of physical and distance learning are being implemented by schools, colleges, and universities. The rapid development of technology and shift towards virtual learning has enabled many students to acquire useful knowledge from the comfort of their homes.

Remote education also provides convenience to both staff and students. However, it has also caused numerous issues and challenges for its stakeholders. Online learning impacts their performance and productivity. Instructors have to deal with the increased workload, being actively available online the whole day, learning the use and application of online tools and new pedagogical methods of teaching. Numerous sources have mentioned the need for a gradual transition and shift towards virtual learning. This will provide ample time for students and faculty to adapt to the new learning environment and culture.

The term technology can be defined in two different ways. Based on the Longman dictionary, the term technology can be defined as the tools or machines that are innovative and new or the modern ways of executing deliverables using smart devices (Longman Dictionary of Contemporary English 2020). On the other hand, in the oxford dictionary, the term technology is defined as the scientific study of the process of creating or designing new machines (Oxford 2020). Technological knowledge of teachers is found to be a fundamental base of education. Accordingly, previous studies have found out that the teachers' technological knowledge influenced and enlarged the students' motivation and interest in learning. However, preparing quality pedagogical online content is a time-consuming and labour-intensive task (Rohaani 2009). Ouyang and Stanley (2014) claimed that educational technology is growing at an unprecedented rate.

### **2.5.2 Role of BBL in Teaching [Faculty]**

Teachers vary from one another, especially in terms of the acceptance level of integrating technology. Some teachers view technology integration as a supplementary tool and assistance to traditional learning but some teachers consider using technology in teaching to be necessary (Mohsen and Shafeeq 2014). Additionally, some teachers have the fear that online learning and

virtual lessons may negatively affect their face-to-face teaching lessons. BBL enables the teachers to create innovative lessons that encourage the students to learn. Likewise, many platforms used around the world for online teaching is delivered via lecture-based methods only, but BBL provides student-centered tools as well as pedagogical tools.

The teachers' deemed the techniques used in the lesson as the heart of the lesson since it determines the outcome of the lesson. As stated by Kagan (1992), a teacher's belief system has a close connection with their teaching style. In addition, BBL provides constructivist and interactive approaches that help in building skills that are considered essential in the 21<sup>st</sup> century, for the creation of a digitally sound teacher (Mohsen and Shafeeq 2014).

BBL can be a useful, beneficial and handy tool especially for the new teachers (Suk Hwang and Vrongistinos 2012). In addition, BBL enables all teachers to work better on their teaching materials and upload valid ones in the system. At the end of the course, teachers can reflect upon their uploaded materials, share their reflections with their team and support other teachers. This allows the teacher to gain an insight into the materials and to reach their potential (Mclaughlin 1991). The feedback mechanism also allows the students to reach their true potential.

BBL at a Dental college was a functional tool to be used at Brigham Young University. In the Dental College, faculty members were delivering more teacher-centered activities and lessons. Nevertheless, using BBL allowed the faculty to alter their teaching methods and implement more student-centered lessons. Including technology and BBL in the Dental College enabled the faculty to set a plan for their future development and set a clear path to include technology in their lessons. The modern pedagogy of BBL, therefore, influenced the Dental school curriculum significantly (Dana 2019).

In another part of the world in Oman, another positive experience has been observed. At Sultan Qaboos University, a researcher conducted a study to examine the degree of acceptance of technology among the faculty in Oman. Researchers confirmed that any success of distance learning (DL) or learning management system (LMS) starts with the faculty. For the reason that

this journey begins with the faculty's willingness to do so and encouraging their students to employ technology no matter what type is used (Al-Busaidi and Al-Shihi 2009).

Omani investigation was based on accepting technology. This model compares the Learning Management System (LMS) tool utility and the faculty's tangible use of the learning management system tool. Moreover, this Omani experience noted that there are critical elements related to faculty and technology acceptance. For instance, the first element is faculty self-efficacy. The second element is the faculty attitude towards technology, learning management system, BBL and the faculty background information. The third element is faculty teaching experience. The fourth element is the teaching style of the faculty. The fifth and the last element related to faculty is their individual creativity and innovation. There are more elements shown in this study related to the origination such as offering motivation, support, and training for the faculty working at the organization. Also, some elements related to the technology, such as system and service quality.

### **2.5.3 Role of BBL in Learning [Students]**

The fact that BBL is a highly useful tool to implement in the e-learning landscape was argued in plenty of previous studies. Even with some complaints from students about how they find e-learning and BBL to be an unfulfilling experience, the usefulness of BBL was apparent. Somehow the students are frustrated with the whole experience of online learning. In addition, Liaw (2008) mentioned that the secret weapon in the digital world is 'self-sufficiency. Self-efficiency impacts the student's experience and enables them to progress smoothly in the e-learning dimension, and then using the BBL productively. Furthermore, the success of e-learning can be affected by three factors – clear guidelines given to users, interactive learning activities, and BBL framework and it's quality (ibid).

Plenty of universities in the world are competing to provide a good learning environment. A good digital environment is highly desirable for the students. Accordingly, students nowadays are looking for their own space and their second virtual life more than reality and their real-life (SELWYN 2007). BBL empowered the students to interact with their faculty in innovative ways. In addition, BBL allowed the student to execute assessments and appear for exams on the go to



ease their learning process and decrease the examination anxiety and provide them free time for their personal lives (Neville 2003).

In the education department, BBL has been a big aiding factor for students. The students in the education program are expected to engage in teaching practice. BBL offered a good virtual environment for them to practice teaching through the microteaching method (Yamamoto and Hicks 2007). In this method, students are usually asked to film very short videos teaching a particular concept, then uploading it on the BBL with all the details of planning a lesson plan and creating worksheets for the lesson. After that, the faculty discuss their teaching performance based on their videos and discuss their strengths and areas of developments.

This experience will assist students to develop their teaching by working on their weakness and keeping up with the good ones. Students at Slippery Rock University produced digital videos of their teaching for self-reflection and faculty feedback within BBL. The study showed that giving continual feedback for students develop the students' performance positively on their teaching skills progress (Yamamoto and Hicks 2007).

On the other hand, another study had been conducted in Turkey at Ankara University back in 2017, on using BBL and its interactive whiteboard. According to Tunaboğlu and Demir (2016), the investigation showed that using the interactive whiteboard in BBL influenced the students' learning positively and improved their mathematical development. In addition, using the interactive whiteboard in the BBL influenced the students' enthusiasm, attitude and self-ability as well. Furthermore, Baburajan, Noushad and Shaikh (2019) claimed that the most common issues encountered by students who are using Blackboard Learn are when the system freezes during the exams and when the BBL takes a lot of time to log in.

A BBL research was conducted at Curtin University in Western Australia. The participant students in the study were from the engineering department. They were questioned using a questionnaire. Participants provided their feedback on BBL as a tool for the blended learning method. Findings showed that the students were able to meet the learning objectives and outcomes successfully whilst using BBL and a blended learning tool. In addition, the findings of this research showed

that engineering students' satisfaction percentage exceeded the university expectations (Anwar 2011).

Another study conducted in the UAE at the University of Sharjah, to investigate the students' achievement and its correlations with e-learning connections and students' self-efficacy in technology information. In this study, the researcher adopted two frameworks. The first one was e-learning interactions based on Moore (1989) and Devries (1996) framework and the second one was self-efficacy based on Bandura (1997). The findings of this study found that whenever the student's communication skills with others are improved, the student's marks also improved. On the other hand, students' self-efficacy can be affected by students' interactions in the digital environment. Research found that there is no significant correlation between students' achievements and technology self-efficacy (Abulibdeh and Hassan 2011).

#### **2.5.4 BBL and Remote Education**

Remote or distance learning is a concept of providing virtual education. It is associated with the concept of teaching where the teacher and students are not physically present together in a conventional classroom setting. Instead, they are separated and connected through virtual technology. It can assume various forms and has continued to evolve in modern times. The increased number of students and problems regarding proximity and timing is a precursor to remote learning (Anon 2020).

BBL has been functional for remote learning for a substantial period of time. It is used extensively in learning programs and e-learning. Many universities have shifted from completely traditional methods of teaching to the online and web-based teaching framework. Many faculty members living at a distance or interested in remote learning were benefitted from the innovative technology and sophisticated systems of BBL. Students can access notes, presentations, and related materials from their homes at flexible times. BBL is a pioneer of distance learning and has paved the way for a bright future. Virtual learning of BBL has created many new possibilities and benefited both faculty and students. It has various benefits like flexibility and convenience for all users.

Furthermore, BBL possesses a huge data storage and retrieval system for collecting and storing important information (Indu 2018).

The most common type of remote education is the synchronous learning mode. In this, faculty and students connect with each other through an online platform like BBL and interact with one other. Faculty members can deliver lectures, provide quizzes or assignments, check their students' works and solve their queries. In asynchronous sessions, faculty and students can engage online and interact through different media. It does not meet the required criteria of scaffolding and social interaction. Students cannot be assisted during the sessions and no live discussions can take place before. But, now with Collaborate Ultra (CU), live discussions can be engaged in, and read scaffolding can be performed as well. On the contrary, it benefits the students and faculty by providing them convenience and ease. They can choose their own time to access the presentation and lectures. This is extremely useful for students living in remote or distant areas or when the students or faculty are working part-time.

Many researchers and analysts have examined the differences between remote education and traditional methods of education. The advent of online education has sparked this debate and various arguments are presented supporting each method. An online education system is usually more cost-effective compared to pursuing the same course in a traditional classroom. This is particularly true for higher education. Another benefit of remote education over its physical counterpart is the flexibility of time and place. Faculty and students can teach or study in their chosen time. On the flip side, physical learning is considered important for social learning and growth. Students can interact with the faculty and their peers more intensively when in close physical proximity.

Studies showed that remote learning enhances the student's learning and skill development. Similarly, physical education can enable students to learn through tools and equipment. Many secondary and higher-level courses require equipment, apparatus, or laboratories to explain important concepts. In remote learning, it is not always possible. Hence, there are pros and cons for each type of learning method.

### **2.5.5 History of BBL in Higher Education**

BBL is the biggest company in the world that offers education technology services. This company revealed that the number of users around the globe, currently, is about one hundred million and counting (Blackboard 2020). Blackboard started with two young men, Michael Chasen and Matthew Pittinsky, who believed in the advantages of the internet and wanted to change the way of education. They started setting up the company back in 1997 by borrowing chairs, tables, and computers and that company name were Blackboard LLC at that time. They predicted the future of technology and how it will impact and support teaching and learning especially for higher education.

The two friends were then joined with two more and their names are Daniel Cane and Stephen Gilfus. They joined all their forces and shared a common dream about the future of education and the digital learning systems using computers and technology. They started the first setup from their bedroom and they built their very first course of the management system as a project for their graduation from Cornell University. They worked on developing Blackboard LLC and changed its name to Blackboard Inc. (Blackboard 2020).

Blackboard Inc. was launched officially in 2004. Blackboard Inc. collaborated with tutelage providence equity in 2011 to keep working, developing the platform and reframing the future of education. Thereafter, it started to grow at a fast pace and it eventually became the biggest education technology company in the world. It now serves a large number of universities and millions of users around the globe. Blackboard Company is still working on developing the services provided by the company to shape international education and provide the best educational technology services worldwide. Their vision is to provide the best experience for learners either in the classroom or outside the classroom (Blackboard 2020).

Digital technology and online learning tools were adopted much more rapidly by younger generations. They were born in the digital era and had no problem transitioning towards an online system. However, most institutions still prefer teaching higher levels in a traditional way. This is because of the in-depth discussions and analysis required in higher-level courses. Many faculty

members are Luddite and face issues while dealing with technology. That is why they have always been reluctant to fully shift from physical learning to remote learning.

BBL is not just limited to remote learning, it provides various other services to all levels of education. Their integrated system is of utmost importance in colleges and universities. Learning Management System enables users to enroll, study and appear for exams. It also provides customer support through its help desk. In addition, it has an online face-to-face classroom offered via Collaborate Ultra.

Throughout its history, BBL has evolved and changed according to the needs of the customers. The organization believes in innovation and quality service. Blackboard Academy is an online teaching tool that allows teachers to conduct workshops and seminars. Faculty members can use the user-friendly interface and get connected with their colleagues and students. It enables integration through flexible architecture and provides a wide range of facilities for educational purposes. Apart from this, BBL provides digital learning avenues for students and institutions (Meda 2017).

Numerous literature documents have recorded the history and origin of BBL. In the book Socallt '04: From Chalkboard to Blackboard, authors Lahaie and Williams described the rapid changes in technology and transition towards an e-learning system. The book explains the discussions in a seminar session conducted in February 2004. It was regarding the new developments in science and technology for higher-level education. The aspect of changes was mostly critical, and the surveys conducted during the session showed similar results.

Faculty members were skeptical towards the changes. The faculty felt that lower-level integration between students and faculty will affect the level of education they are providing. Few faculty members described their experience with the BBL in a different manner. They mentioned that using BBL was difficult at first but gradually it became more convenient for the day-to-day tasks (Williams 2005).

Knowledge is not the only focus at any higher education institution, it should include more than that. According to Cuban (2009), educational institutes cannot be operated as regular businesses. He believed that imparting knowledge is not the only objective of education. Many other objectives like grooming and social integration are crucial for the cognitive, psychological, and social development of children. In addition, he also argued that this was only possible if a degree of physical connection was maintained between faculty and students. Most critical writers of the 2000s have shown discontent with e-learning and virtual learning (ibid).

#### **2.5.6 Perceptions of BBL and Experiences around the World**

BBL is a useful tool in the educational industry. According to Bossche (2011), new learning technologies like BBL have created new ventures and opportunities in the field of education. It encountered varying perceptions and attitudes from different stakeholders and users. The research paper identifies major changes in attitudes and the reasons behind them. Many users encountered problems and technological constraints while using online learning methods. The author explained that the popularity of BBL and the polarizing perceptions about its use and applicability affect its perception among the users.

Another article focuses on the implementation of Blackboard's program in different universities (Marder 2019). Many conventional universities like the Baptist University of Houston have shifted towards the Ultra Course View Learning Model launched by BBL. According to Heirdsfield (2011), it was forecasted that the impact and significance of these new learning methods would be substantial. Online learning models are considered to be a breakthrough development by many educationalists and writers.

Sometimes when researchers are examining the efficiency of BBL, they use the self-construal scales. As reported by Levine (2006), self-construal scales are not an appropriate method of research in a cross-cultural environment. She emphasized the need for a diverse study on attitudes and perceptions including changes in beliefs over a period. A similar analysis was conducted by Coates (2007), wherein he talked about campus-based student engagement and interaction. New and emerging technologies like BBL have developed a newfound interest in the educational

curriculum for many students. The online learning model deployed by BBL has created a superficial experience for all stakeholders (ibid).

Another very useful resource to gauge experiences of BBL around the world is the work of Bradford (2007). Key points of the article were the description of BBL's wide and diversified product range for all its customers and the advantages of its learning system. Bradford (2007) described five (5) main benefits that generate a positive response for its products and enhance the users' experience across the world. He mentions the easy access and availability of BBL products as a game-changer in the online learning environment along with the potential benefits like skill development and seamless collection of students' data.

Bradford (2007), on the contrary, identified major hurdles and obstacles for online learning and drawbacks of BBL in higher-level education. According to him, different operating systems and software around the world respond differently to BBL's learning management system. This creates problems for different users around the world, especially the Luddite faculty members. Furthermore, the expenses of installation and complicated user interface as disadvantages of Blackboard are learning system. Using data from various surveys, he concluded that the implementation, and use, of BBL in higher levels of education, has resulted in increasingly progressive attitudes towards virtual learning (ibid).

There are many ways allowing the faculty to achieve the e-learning objectives. As mentioned by Bradford (2007), seven principles are required to achieve the objectives of e-learning. Some of these are the provision of concise and clear guidelines from the instructor and peer-review programs. Boshielo (2014) conducted research on the experiences and perceptions regarding BBL in a South African University. His research and survey showed a concerning picture of Blackboard's learning management system. The main problems identified at the University of Limpopo, South Africa were accessibility issues in the network of BBL in university campus and hostels. This included weak Wi-Fi for online learning and a shortage of computer equipment.

The challenges for many campuses and universities across Asia and Africa are quite similar. This is a major setback for learning management systems. Therefore, the overall experience for their

services is not ideal in South Africa and Asia. In addition, the previous study mentioned the lapses and shortages in university provisions and considered these to be the reason for the negative experience faced by Blackboard's faculty and students (Boshielo 2014).

Different perceptions were documented for the learning management system and educational tools of BBL around the world. Factors like cultural differences and availability of resources influenced the perception and attitude of users. In third world countries with limited resources, the implementation of virtual learning through BBL posed much bigger challenges. The final result was the dissatisfaction of faculty and students.

A similar bias towards traditional methods of teaching and skepticism of faculty members were also responsible for their perception of BBL. Differences in perception and response towards online learning can be attributed to many different factors. Increased globalization and accessibility of knowledge in all parts of the world has led to a change and transition in the attitudes of instructors and educators, towards virtual education (Bradford 2007).

### **2.5.7 Professional Views towards the Use of BBL**

Successful online experiences do not occur by chance. A successful online experience needs efforts and many steps. According to An, Kim and Kim (2008), based on an investigation conducted in 2008, findings demonstrated that the success of the online experience depends on five factors. The first factor is individual accountability and responsibility for each role assigned. The second factor is surrounding each individual with an effective team that can support when required. The third factor is having a good, supportive understanding, and positive leader to enable each individual to express ideas. The fourth factor is working hard on building new skills in each individual and being proactive. The last and the fifth factor is giving clear instructions (ibid).

Despite all the promises technology makes, there are many issues faced by users while implementing the technology inside or outside the classroom (Wachira and Keengwe 2010). In addition, when studies showed outstanding development in technology usage, and the number of technology users is increasing, the faculty expressed an opposing perspective. In other words, the



teachers were still reluctant in using technology within education. As a result, the statistics showed a big drop in technology integration in the classroom.

Student's grades can be good evidence of the success of teaching methods. Upton (2006), compared between students' final grades between the ones who engaged in online learning and the ones who opted for traditional learning. The findings of the study showed that there was no difference between the students who participated in online learning and the ones who underwent traditional learning. Additionally, students seemed to enjoy online learning despite their unwillingness to do so at the beginning. Students showed some improvement in their learning style and they showed more independence. It could be inferred that online learning is a great deal for both students and faculty and it offered many good resources for them both (ibid).

### **2.5.8 Role of BBL in Teaching and Learning**

BBL offers a variety of services for teaching and learning. It caters to all levels of education. Its Learning Management System provides a platform for students and teachers to communicate with each other. It facilitates the gathering of information as well as enrollment. It also provides services of virtual learning, online examinations, and e-library. Bradford (2007) described Blackboard's facilities as simple and efficient. It provides tools for social interaction between the faculty members and students through announcement portals and distance learning classroom. It also provides an efficient correspondence facility to enhance learning through classified e-mails. These are secured and protected through their web-based algorithms (Ballard 2004).

Another study at Boston University approved that the use of Blackboard Learn worked well in the psychology course. Kumar (2007) examined the use of Blackboard tools in a psychology class. She mentioned innovative tools and designs made the classes more intriguing for the students. Results from her survey showed increasing enthusiasm in students and better grades because of using virtual learning software. She also listed the facilities and support that BBL provides to the faculty, including helpdesk and IT support. All of these enhanced the learning and teaching process at Boston University.

The Faculty's main concern is the achievement of the lesson objectives. Given the use of BBL, achieving objectives may be different from the traditional methods of teaching. According to Jahnke (2010), the learning outcomes from remote education and BBL varied from the traditional ways of learning. She added that technology is useful for learning provided it is implemented in the right manner.

There are certain important parameters for the applicability of the technology. First of all, the technology provided by BBL or any other company must be examined objectively in order to ensure that it provides all relevant tools. Once the right choice is made, decision-makers must choose a learning methodology. This can range from physical and traditional education to remote education. Faculty can opt for blended models or hybrids based on their needs. The criteria for choosing should be clear and a cost-benefit analysis must be conducted. Finally, the learning model should be chosen through a mutual agreement among students.

Students should have the option to decide how they want to engage in the courses, either online or attend to it through the traditional approach. Jahnke (2010) believed that this is a very important step, but many universities fail to acknowledge the same. Students must be taken on board for any decision since they are important stakeholder for the University and BBL. She stated that if the whole process of choosing the right methodology is followed, then many problems of virtual learning can be eliminated. She recommended a collaborative learning tool and hybrid models with an optimal mix to ensure sufficient social integration as well as convenience to all parties involved in the process (ibid).

In the learning process, the students should be involved in taking decisions and should not be isolated. Dickey (2004) presented a concise argument about the flaws of online learning and the feeling of seclusion experienced by the students. As a result, the core objectives of education including grooming of students, peer interactions and social integration are not met in distance learning and teaching methods. Therefore, they must be used only when it is absolutely necessary or in a collaboration with traditional teaching methods. He also mentioned that the faculty and administration of educational institutes should not rush towards a permanent shift. Instead, they should opt for a gradual transition and allow all parties to learn and adapt to online systems (ibid).

Remote education can be very stressful for some faculty members as well as students. This idea of distress and problems caused by remote education was conveyed by West (2007). According to Shannon, et al. (2020), the technical and technological challenges of web-based learning and a need for scaffold learning is ever-present in explaining the role of BBL in environmental training and enhancement of cyber-security.

BBL has improved the online learning experience for many students and faculty members through its rigorous approach and innovative technology. It has opened new avenues for students living in distant areas or working part-time. Moreover, its user-friendly interface has allowed educators to quickly adapt to it. All of these factors have played an important role in the improvement of online learning and teaching facilities available (Shannon, et al. 2020). Educators and instructors have appreciated the role of Blackboard in the development of e-learning facilities (Liaw 2008).

#### **2.5.9 Future of BBL in Higher Education**

Technology has continued to develop and progress at unprecedented rates. Education, in many ways today, is affected and benefitted by the rapid rise in technology. From increased piracy and plagiarism in student's works to easily accessible virtual classrooms, it has changed the way education is imparted in the modern world. BBL sparked the revolutionary trend in education by providing efficient Learning Management Systems and accessibility to students around the world. The internet provides limitless resources and facilities to enhance education.

Despite all of these resources, many researchers have observed a declining trend in the standard and quality of higher-level education. One such research was conducted by Davis (2017), wherein they identified numerous issues with the sustainability of the current infrastructure of e-learning. He added that the volatility and uncertainty of future education make it very difficult to plan and prepare for the future. New and innovative ways of education are emerging within a very short span of time. This makes it challenging for the educators and students to adapt (ibid).

An in-depth analysis of new learning methodologies is not possible because of the rapid changes. The interviews from faculty members revealed their reluctance towards complete transition in future. Among many identified issues, the prominent one was the leadership crisis. Educators and professors were unsure how the shift from traditional to virtual learning will resolve the situation and enable them to take an active part in teaching (Davis 2017).

On the other hand, the same research showed the perspective of some optimistic candidates regarding the future of BBL in higher education. They believed that the burden on faculty members would be reduced in the future. E-learning through BBL will allow the instructors to focus on the application of knowledge instead of first providing the knowledge to the students. This is because resources and knowledge can be provided digitally and students in higher-level education can easily acquire this knowledge. A bigger objective of education is to teach the application of that knowledge to the students, which can be achieved through the implementation of e-learning activities (ibid).

A key element was recognized in the usefulness of BBL in future. The culture of an organization must be understood, and any transition should not involve a change in culture. This will, otherwise, affect the feasibility of online learning methods. As claimed by Blankenship, et al. (2019), a well-documented resource for online research and analysis for the future role of e-learning is BBL. The role of BBL has continued to increase in the modern world, and it will become more important in the future.

The impact and efficacy of BBL, however, will depend upon many internal and external factors. Changes in demand and supply, faculty perceptions and organization's culture are all important factors that will determine the importance of remote education in future. However, its need cannot be discarded. The outbreak of COVID-19 in 2019-2020 forced many higher education institutes to shift towards remote education. This will further enhance the role of BBL and distance learning in the future (Li and Lalani 2020).

## **2.6 Review of the Related Literature**

In this section, the previously conducted studies are discussed. The two main topics of this study are, technology integration and BBL utilization. Previous studies on technology integration will be covered first, followed by the studies on the utilization of BBL in the educational domain.

### **2.6.1 Technology Integration**

Ten previous studies will be summarized from different countries around the world and different periods of publication. This includes Turkey, the UAE, the USA, India, China, Jordan, and Oman. A summary of every study will be covered in the following sections.

#### ***Gülbahar's paper (2007) in Turkey***

Since the introduction of technology in teaching and learning, large amount of funds have been considered for providing high tech tools and systems to offer smart learning. Despite all the efforts, there is unsatisfactory progress in online teaching and learning. Gülbahar (2007) claimed in this research that integrating technology is considerably complex and leads to additional stress among the stakeholders and teachers. On the other hand, back in 2007 technology promised to overcome any issues faced in the integration process. In this paper, the main purpose was to highlight the process of integrating technology in a private school in Turkey. This study involved 105 teachers, 25 admin staff and 376 grade 12 students. Two data tools were used to gather data, a questionnaire with teachers and admin staff and interviews with grade 12 students concerning their computer literacy and the utilization of ICT. The results of this study indicated that teachers, admin staff and students were capable of integrating technology but the lack of guidelines made the overall experience unfavorable. In addition, students complained that the utilization of ICT was not adequate to suit their needs.

#### ***Keengwe, Onchwari, and Wachira's paper (2008) in the USA***

Back in 2008, research was conducted to study the integration of computers and technology in education. According to Keengwe, Onchwari, and Wachira (2008), many educational organizations spent millions of dollars to embed technology in education but many practices were

not successful because the technology was not integrated appropriately. At the same time, several schools that used the technology effectively were observed to improve and use technology in a remarkable way. However, there is always a problem in terms of integrating technology and its impact on student's learning. The findings of this paper suggested that the effective integration of technology can change people's lives. As a result, technology has enormous potential and can offer huge assistance for teachers, but at the same time, it affects the student's learning due to the external and internal technology barriers.

#### ***Keengwe, Schnellert, and Mills's paper (2012) in USA***

In 2012 a study was conducted at a particular countryside Midwestern high school in the USA. The selected students were from grades 10, 11 and 12 and the total number of the students that participated in this study was 104. The main goal of this study was to examine the impact of using laptops, on student's learning. The research launched a laptop initiative in this rural high school for determining its impact on the learning abilities of the students. A survey was used in this study to collect the student's perception of the laptop's impact on their learning and the educational instructional implementation. The findings of the study revealed that the laptop affected the student's learning positively and increased their engagement academically. In addition, the study revealed that students argued that there was a need for members of the faculty to improve their collaboration with the students and to expand the scope of applications of instructional technology (Keengwe, Schnellert, and Mills 2012).

#### ***Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur's paper (2012) in USA***

Previous studies argued that some teacher's beliefs and their technological practices did not align. There were some external barriers that stopped teachers from utilizing technology in class in a way that aligned with their beliefs. External barriers can be technical support in school or university and access to technological tools. In this study, the participants were teachers teaching grade 12. The data collection tool that was used is the interview. The main purpose of this study was to investigate the teachers' practices and their pedagogical beliefs in the classroom. The findings of this study suggested that Teachers' individual beliefs and attitudes about the significance and implication of technology influence the students' learning and they were considered as the major influence on the student's success. Furthermore, a large number of teachers revealed that some

other internal factors affected the student's learning such as, being passionate about technology, having a good mentality of solving problems and supporting others in this overall practice of technology integration (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur 2012).

#### ***Keengwe and Onchwari's paper (2009) in the USA***

Regardless of all the promises given in regard to the integration of technology, faculty still faced many issues and challenges with technology integration. This study was conducted back in 2009 in a summer workshop for early childhood teachers. The main purpose of this research was to investigate the children's interaction with the technology application and the instructional tools based on a constructivist pedagogy. Teachers who were integrating technology successfully, noticed a positive difference in children's learning because the technology applications have the potential to help young learners. However, this potential is not enough for their learning to be effective (Keengwe and Onchwari 2009).

#### ***Awadhiya and Miglani's paper (2016) in India***

In India, mobile learning (m-learning) is common in both conventional ways of teaching as well as distance learning (ODL). Many ODL institutions in India are adopting m-learning. However, unluckily, this type of learning was not fully utilized across the nation. The key objectives of this study are investigating the obstacles associated with the implementation of m-learning in India. The data collection tool that was used was a survey. The participants were faculty members teaching in the ODL institutions. The findings of this study suggested that the main obstacles that prevented the faculty from implementing m-learning are the lack of support in m-learning instructional, no policy form-learning was specified and last but not least the lack of technical support (Awadhiya and Miglani 2016).

#### ***Samak and Tawfik's paper (2006) in Jordan***

The main purpose of this study is to discover the reasons that influence the Jordanian teachers' attitude to information, communication and technology (ICT). The targeted population is the Jordanian English teachers who were teaching English as a foreign language (EFL). This study was replicated from another study conducted in Syria back in 2004. A random sample of participants was used and the total number of participants was 363. The study exposed that teachers

have optimistic attitudes towards ICT. In addition, the study revealed that age and teaching experience had a negative relationship with attitudes. On the other hand, qualifications had a positive relationship with attitudes. Another positive relationship was found between training and attitude (Samak and Tawfik 2006).

***Sang, Valcke, Van Braak, and Tondeur's paper (2010) in China***

This study took place in China back in 2010. The core purpose of this study is to examine the influence of Chinese student-teachers gender, philosophies, self-efficacy, computer ability, and computer attitudes on the utilization of ICT. This study included student-teachers from 4 different universities in China. The total number of participants was 727. A survey was utilized to gather the data. Findings showed that all variables mentioned above, that is, beliefs, self-efficacy, computer efficacy, and computer attitudes, were significantly correlated with ICT integration. Only the student-teacher's genders were not significantly correlated with ICT integration (Sang, Valcke, Van Braak, and Tondeur 2010).

***Tawafak, Romli, and Alsinani's paper (2019) in Oman***

The focus of this paper is the assessments' feedback, learning satisfaction and the utilizing of the e-learning system. This study took place at the University of Communication in Oman. The purpose of this study was to come up with a 'University Communication (UCOM) model to develop the student's assessment process and evaluating their performance academically in better ways. Thus, a survey was distributed to the students to check their satisfaction level with the UCOM model. The results of the study revealed that the UCOM model influenced the student's assessment feedback positively through the utilization of the E-learning approach (Tawafak, Romli, and Alsinani 2019).

***Schoepp's paper (2005) in UAE***

The paper investigated the barriers faced by the faculty members and their attempts to integrate technology at the university. The data tool was used to collect the data was a web-based questionnaire. The participants consisted of a sample group of 69 faculty members out of 288 from a small Emirati university. This study indicated that the level of technology integration was low.



For this reason, that the whole learning experience lacks guidance and training. Thus, the implementation of technology remained low. The technology standards was a barrier as well. Faculty and students were not sure about the expectations. Providing clear standards of technology integration is the key to implement technology. Finally, the researcher believed that long-term professional development programs lack guidance towards the basics of technology integration (Schoepp 2005).

### **2.6.2 The Utilization of BBL**

Ten previous studies in regard to BBL will be summarized as part of the study. Previous studies took place in different countries such as the UAE, the USA, the KSA, Kuwait, Australia, and the UK. All studies are discussed briefly in the following sections.

#### ***Baburajan, Noushad, and Shaikh (2019) in UAE***

This study took place in the UAE in Dubai last year in 2019. The focus of this study was investigating the Blackboard practices based on the user's perceptions and their experience on BBL. The participants in this study were students and faculty members from the engineering and business department. The findings of this study suggested that students and faculty members preferred to have hybrid learning, blended learning of face to face learning and teaching and Blackboard-based learning. Students raised two concerns about BBL as the following when the students were taking final exams, the system froze and it takes a lot of time to log in to the BBL platform (Baburajan, Noushad, and Shaikh 2019).

#### ***Stone, Bongiorno, Hinegardner, and Williams (2004) in the USA***

The paper discussed delivering the Web-based instructions through BBL. It was a collaborative project. The main target was examining the development of the writing skills of the students. This study took place at the University of Maryland, School of Pharmacy and the Health Sciences. A group of the faculty member's delivered a course which was on 'how to write academic research paper'. This course was delivered through BBL. A survey was used to gather the data from students and faculty members. The total number of participants was 200. The findings of this study suggested that the advantages of Blackboard covered the shortage of staffing and overcome the

scheduling issues. In addition, this course enlarged the collaboration between library faculty and pharmacy faculty. BBL was beneficial for distance learning students too. 70.5% of the respondents strongly agreed that BBL was a good software to use to teach the basics of writing an academic research paper. The only issues witnessed by participants were accessing issues.

### ***Hamade's paper (2012) in Kuwait***

This study was conducted at the University of Kuwait back in 2012. They were using Yahoo Group as an alternative to learning management before the introduction of BBL in 2005. Faculty were advised to use BBL in order to support their hybrid and blended learning practices. The purpose of this study was to measure the usability of Yahoo Groups and compare it to BBL from the perspective of the students. A structured questionnaire was completed by 102 students and it was followed by a focus group to highlight the pros and cons of each software platform. The findings of this study showed that most undergraduate students preferred using Yahoo Groups. A small number of students preferred using BBL. Yahoo Group was preferred because it was simple, easy to use and accessible. BBL, on the other hand, was preferred by a small number of participants because students were able to discuss topics and submit assignments in an easier manner (Hamade 2012).

### ***Aldubaibi's paper (2018) in KSA***

This study was conducted in the Kingdom of Saudi Arabia (KSA). The main purpose of this study was to understand the lecturers' pedagogic practices and their viewpoints in terms of the usability of BBL. This paper was a comparison between the lecturers' perspectives in two universities, Saudi and Australian universities. A survey and interviews were done to gather the data from Saudi and Australian lecturers'. In the survey, the total number of participants was 285 Saudi and Australian. A total of 6 lecturers were interviewed, 3 Australians and 3 Saudis. Findings exposed that lecturers from both countries have an overall positive perception of the utilization of BBL. The findings also revealed that Saudi and Australian lecturers were different and they had dissimilar perceptions of Blackboard. In KSA, BBL allowed better communication with students. Whereas in Australia, the primary advantage of using the BBL tool was the easy accessibility.

### ***Tawalbeh's paper (2018) in KSA***

The main purpose of this paper was to examine the perceptions of the EFL instructor's perceptions in regards to BBL as a Learning Management System (LMS). This study took place at Taif University in Saudi Arabia. The second purpose of this paper was to highlight the difficulties and come up with suggestions to overcome the difficulties faced while using BBL. In this study, a questionnaire was used to gather data from instructors. The total number of instructors was 102. The finding suggested that 75% of the instructors did not use BBL before and that could affect their perceptions. Some of the instructors found the features of the blackboard poor and some considered it to be worse (very poor). However, the instructors believed that BBL has a positive impact on the learning process. It was recommended in this paper to provide intensive BBL training to instructors in order to allow them to explore and utilize the features of the digital tool in a better manner (Tawalbeh 2018).

### ***Fritz's paper (2003) in France***

A language course was delivered via Blackboard in the academic year of 2001 and 2002. A small number of students did their online quizzes per week, and the rest of the students did it the traditional way. The total number of students who did it online was 165 students. The quizzes were created on the Spanish language course through BBL. The main purpose of this study was to investigate the student's experience in digital quizzes. A survey was distributed among students. The findings of the study indicated that the BBL online quizzes were practical for the language classes. The students were able to operate it quickly. Thus, 10 to 15 minutes from the class time was saved. In addition, the faculty's time was saved too because the quizzes were designed to be self-correcting. On the other hand, the disadvantages of using BBL was proctoring the students during the quizzes as the students were unsupervised during the quiz (Fritz 2003).

### ***Szabo and Hastings's (2000) in the UK***

This study investigated the efficiency of BBL as a lecturing tool with undergraduate students. A survey was used as a data collection tool. The participants were undergraduate students. The results suggested that no significant differences found after using the BBL as a main lecturing tool. Thus, there was no difference between BBL and traditional ways of lecturing such as using PowerPoint. The findings also revealed that the content and the subject difficulty was the only thing that

matters, not the lecturing technique. BBL contributed to minor difference only (Szabo and Hastings 2000).

#### ***Kinash, Brand and Mathew's (2012) in Australia***

This paper was about the perceptions of Blackboard Mobile Learn and iPads from the student's perspectives. A survey was conducted with 135 students who were involved in mobile learning and Blackboard course to highlight their experiences. The main purpose of this study is to investigate the students learning and find out if the students perceived a difference in their learning. Results of this study revealed that students used mobile devices on Blackboard to a similar amount they used it for emailing, searching and accessing the university portal. There was a positive correlation between motivation and Blackboard Mobile Learn. The overall experience was positive, but the only factor that mattered was the course difficulty itself (Kinash, Brand and Mathew 2012).

#### ***Dron's paper (2006) in the UK***

In this paper, the researcher claimed that the structural and systemic features of BBL could direct the power of the instructors and the students through the software and the system design. A survey was created for both instructors and students to explore their views on this matter. The findings suggested that BBL can be considered as Fordism learning which is not beneficial for the learners. However, this negative point can be turned into a positive point, since BBL can offer lots of benefits for students and instructors in higher education (Dron 2006).

#### ***Martin's paper (2006) in the USA***

This paper evaluated the application of Blackboard as a learning management system (LMS) in a computer literacy course. The main purpose of this study was to discover the usefulness of blackboard as a content delivery agent and assure that it helped the student's learning. Students and instructors were involved in an online survey. The total number of undergraduate students who participated in this study was 145 and a total of 7 instructors were involved. Findings of this study revealed that provision of a grade book and giving students immediate feedback, and accessing course materials round the clock were the most useful features. Both students and faculty had a positive experience using Blackboard LMS.

### **2.6.3 More Related Studies**

A wide array of literature is present to examine the perceptions of faculty and teachers towards remote education in general and BBL in particular. The role of new software dedicated to online teaching. Interactive Whiteboard (IWB) is described as a useful tool for the facilitation of higher-level education. Faculty surveyed by the researchers showed a good response towards the new system of academia and the only issue they highlighted was technical problems. Their experience with the use of new technology for distant learning was immaculate. In total, 213 faculty members were surveyed by İstifçi (2018), and an overwhelming majority portrayed a liking towards the smart board and other digital technologies.

In any change implementation, some will agree and some with disagree. In other words, there is bound to be a certain degree of resistance to the implementation of digital technologies in the educational domain. According to Bossche (2011), the inclusion of remote education has seen mixed reviews from faculty and instructors. Innovative technology has paved the way towards more efficient distance learning techniques, but the faculty has evidently exhibited discontent. Furthermore, the faculty members expressed some concerns regarding the time needed to explore and practice the tools and master the technology and the problems with educational integrity.

This study examined some of the common perceptions and the root causes behind faculty discontentment. Many educators had a false belief that all web-based learning platforms were solely for distant learning. Their skewed approach towards the hybrid education models and distant learning was also documented. Furthermore, Hullinger (2008) mentioned that the inclusion of new technology in distant learning has created a demand for greater accountability in higher education.

Many professors and faculty have openly criticized virtual learning platforms to be easy to manipulate by tech-savvy students. This provided certain students with an unfair advantage over their peers. Comparative studies have shown a greater degree of accountability in traditional systems of education. The need for impartial assessment in higher education is detrimental to the success of education systems. This is why, many companies, including BBL Inc., have focused on developing robust security protocols and rigorous checks and measures.

The perception of the faculty members is vital as they will be the backbone of this shift towards the implementation of e-learning practices. Govender (2018) studied the perception of the faculty members on the implementation of new technology. She stated that the implementation made faculty members critical because the online classes increased their burden. The workload for the professors and staff increased because of learning the system and assessing students through the same platforms. They also complained about the students' notion that instructors would be present at all times to facilitate them. Faculty members, as a result, believe that their working hours have piled up.

The faculty also experienced issues with navigation and finding appropriate tools in the online classes. Another important aspect of the negative impression of remote learning was the technical issues encountered by faculty members. According to Anderson (2012), faculty members criticized online education because of reduced time for preparation of learning material and difficulty in facilitating all students. Other notable concerns were disciplinary issues of students and network problems. Many universities around the world encountered similar problems and the attitude of faculty has remained skeptical towards the transition of delivering education.

Despite all the negative points raised about BBL practice, there were a number of positive points that need to be considered. Naser Qamhieh (2013) presented the other side of the argument. He concluded that online learning program on BBL has improved the integration and social interaction of faculty and students. The study was conducted at the University of UAE and the results showed a positive experience for faculty members. The survey showed that both faculty members and students enjoyed the experience of learning through BBL.

In another similar study conducted in Kenya by Nyabawa (2016), it was observed that the faculty's response towards BBL was encouraging and they appreciated the services it provided for the enhancement of the overall learning experience. Integrating this system of BBL into higher education will improve the overall academic experience. This tool imperatively boosted teaching and learning in higher education (ibid).

Multiple models are being deployed and used for higher-level studies. In the article by Srivastava (2020), the author analyzed remote education. Many contemporary courses can be shifted permanently to online learning models. Existing models like the use of non-university instructors on Coursera was explained and discussed. It is a critical phase when universities need to decide which courses and lessons have a basic appeal and do not require social interaction. These courses can easily be shifted to the remote learning models.

Many articles stressed the importance of blended learning. Srivastava (2020) argued the need for blended learning models wherein a portion of education would be presented in a digital format, like lectures and presentations. Students can access these materials at their convenient time and location. Other parts of the course are taught through the traditional methods and an integrated method of learning is applied. He further conveyed the message of optimal resource utilization in higher-level education. Remote learning can reduce a significant amount of burden for the university faculty and outsourcing of basic courses and lessons can allow them to teach more advanced and research-based courses easily.

Complete technology integration will not be that effective; it needs to combine two types of learning that are traditional and online learning. In accordance with Srivastava (2020), the future has a combination of different ‘hybrid models’ of education. This includes the use of learning management systems, blended and virtual learning, etc. The constraints of technology have also caused a significant impact on the models.

These limitations must be examined, and the feasibility of the model depends largely on the mitigation of these constraints. Software errors and lack of flexibility to scale has made it difficult for all universities to transition successfully towards virtual learning models. This problem, however, does not exist in the BBL model due to its robust architecture and flexibility. A positive aspect of BBL is its scalability. Its learning management system can be used in smaller institutes as well as larger universities with thousands of students. This feature makes it stand out among its rivals such as Zoom Inc. According to Elsayy & Ahmed (2019), BBL also provides impenetrable cybersecurity through its safety protocols and encryptions.

Design-oriented courses offered a clear picture of lessons for learners. Another empirical study on the learning models was conducted and documented by Levitin (2018). He described the existing models as revolutionary and design-oriented because they have managed to solve various problems associated with traditional methods of teaching. He emphasized that social integration is not relevant in the life of students at specialized levels of education, or diplomas. He also mentioned the problem of education not being able to keep up with digitalization and fast expansion in technology. All of these factors are important for resource optimization and shifting towards online learning models.

The main element of the technology implementation is the user's attitude. Peterson (2020) highlighted key shifts in higher-level education. He describes the skeptical attitude towards online learning before the outbreak of COVID-19 and its necessity after the pandemic. He claimed that the spread of COVID-19 has created a need for online and virtual learning. Such extenuating circumstances is expected to pave the way for better technology and IT products catering to the needs of both faculty and students. The study focuses on new and emerging possibilities for an online learning model and a permanent transition towards remote learning.

Online learning faces numerous obstacles that cannot be highlighted without the implementation of the tools. Anderson (2012) extended the argument of obstacles and barriers in online learning models. He noted a shortage of time for preparation of research material and disciplinary issues as fundamental problems associated with remote learning and online education. Faculty members with limited knowledge of technology and online learning tools face problems in conducting their online classes and using e-learning software (ibid).

## **2.7 Other Digital Tools Used in Higher Education**

Another tool that has been utilized enormously in higher education, to deliver online courses, is Moodle. This tool is a course management system tool that can be used to conduct active online courses and it is a free tool (Herayanti, Fuaddunnazmi, & Fisika 2015). A recent study conducted in Romania revealed that the use of Moodle tool is growing every day especially in the education department for the teacher's training purposes (Paragina, Paragina, Jipa, Savu, and Dumitrescu



2011). On the other hand, another current study has been performed at the Portuguese University to compare the students' preference on using BBL or Moodle as a distance learning tool. Of the majority of the students in Portuguese University, approximately about 47% of the students preferred to use BBL over Moodle. Approximately 35% of the students preferred Moodle over BBL. Some students were neutral and did not have any preference. That accounted for 20% of the total number of students (Carvalho, Areal, and Silva 2011).

Microsoft Teams (MT) has been used in the UAE as a digital tool for remote learning during the pandemic. I. It has the feature of collaboration and communication between the teacher and the students. It is a freely available web-based digital tool. This tool has a very good communication feature that enables the users to share, communicate and collaborate with each other. Microsoft Teams increased the productivity of users (Hubbard and Bailey 2018). However, according to Rosenbrock (2020), Microsoft Teams needs further support to allow teachers and students to meet the requirements of the learning and teaching process. In addition, this tool was effective to ensure the critical role of the leadership, thus ensuring the workflow and the performance during this challenging time.

Most of the higher education organizations in the UAE were using Zoom before and after the COVID-19 pandemic. Organizations in the UAE were found to be using Zoom for remote learning and to conduct meetings more frequently in the present times as compared to the situation before the pandemic. As stated by McCoy (2015), during the last few months, Zoom gained a lot of attention from users around the world. The reason is that Zoom offers great competencies and it eases the user's work as well. Communication, collaboration and interaction are fulfilled using Zoom successfully. Zoom can offer a collection of videos that can be used to help teachers to translate the professional training into new habits of the virtual classroom (Aubé, David, Cantin, and Meyer 2003).

## **2.8 Summary**

This chapter covered key topics of the conceptual analysis in this study, namely, technology integration, remote learning in higher education in the UAE, the COVID-19 pandemic and the case

of BBL as a technology integrated tool. In addition, the theoretical analysis discussed the specific theories which are TPACK theory, Bloom's Digital Taxonomy and Connectivism Learning Theory and the broad theories, which are, Activity theory and Scaffolding and Zone of Proximal Developments were critically analyzed. Thereafter, the case of BBL in higher education in the UAE was discussed. A review of related studies in the literature was also analyzed. Finally, the key trends, patterns and challenges associated with remote learning and BBL were highlighted.

Varied studies agreed that technology integration is a road map using varied digital tools to deliver the content. It was highlighted that technology integration is a flexible strategy (Phaal, Farrukh, and Probert 2004). In addition, a number of studies discussed the trends in technology integration. Previous studies agreed that technology integration enabled teachers to set a routine for the lesson. Moreover, all learning resources are accessible and available for learners anytime they want and no matter where they are located. Technology integration improves the user's computer literacy. Whereas, the challenges are the connection issues and the training needed for users before the implementation of the tool (Hanson 2010).

There are plenty of other challenges in technology integration from the teacher's perceptions that were mentioned in previous studies. The patterns of technology integration barriers are related to the fact that access to technology could sometimes be an issue. Secondly, the visualization of the technology is also a potential hurdle. Thirdly, there is also a challenge associated with the professional improvement of teachers and other users. Fourthly, the time used in practising, preparing and the time consumed in using this tool during the lesson is also a hurdle. Barrier number five, and last one, is the teachers' views, principles and beliefs as mentioned earlier in this chapter (Kopcha 2012).

Any transition from one learning style to another needs to be implemented gradually to assure that this shift will be implemented successfully. In accordance with Garfinkle (1994), the author of the book *Systemic Change in Education*, there is a possibility of a complete transition of education towards a virtual environment. He highlighted important elements for its feasible application. In addition, he experienced that faculty members will take time to adjust to modern realities and change their perceptions about remote education. This should, however, not discourage the

universities and educational institutes from gradually transitioning and modifying their teaching methodologies. With a rapidly changing educational structure, schools and universities must focus on the positive aspects of distance learning and blended modules.

Overall viability of online education has remained a major talking point for all levels of education. It has been more scrutinized particularly for higher-level education because of the difficulty and complicated nature of education (Nielsen 2013). Remote education and learning systems have significantly changed the method of higher-level education. Universities have focused on a variety of combinations for their core learning programs. Some have shifted entirely on an online learning model with virtual classes and presentations whereas others have used the Learning Management Systems for the enrollment and data provision to students and faculty. The combination between these models gave rise to the blended learning modules in universities and the results have been very promising for remote education.

Multiple previously conducted studies believe that remote education is a powerful learning style. According to Naser Qamhieh (2013), the practical application of BBL and other software of online education portray much strength. Previous studies raised varied trends about the viability of remote education. The main emphasis of the article was the teaching of basic physics courses using online learning methods. The tools and applications in the BBL provide an ample opportunity to teach these courses and it was relatively easy for the faculty to transition towards this teaching method (ibid).

The general trend between all the related studies demonstrates that integrating technology is beneficial for both students and faculty in higher education. However, the processes present certain challenges in the implementation and integration of the same. For example, the lack of training and guidance for both faculty members and students influence the practice negatively and affect the faculty's readiness and student's readiness for digital learning. Besides, technical issues may arise while technology is in use, making it cumbersome to operate smoothly. Furthermore, providing clear standards for users is a must. Thus, the gap in the existing studies was the lack of training for the faculty and student and the lack of standards and policies to use the technology. Furthermore, evaluating the technical issues and finding out the most common ones and training

the faculty and the students to overcome these kinds of technical issues is a task. Most of the studies conducted on BBL were positive excluding one study in KSA, the faculty members were asking for better LMS software than BBL. Blackboard has some disadvantages such as, it is a time-consuming tool and it makes no significant difference in some previous studies. Thus, this study will add to the existing data about the efficacy of BBL.

The next chapter deliberates the methodology and research design in details.

## **CHAPTER THREE: METHODOLOGY**

### **3.1 Overview of the Chapter**

This chapter highlights the research methodology and how this research was conducted through the period of the study. Various points of the study will be discussed in this chapter including, all phases that this research went through to find answers for the four questions that underpin this study. The chapter starts with a rationale of the research design, a case study approach to BBL, a discussion of the data tool, which is a faculty survey and questionnaire, the data analysis methods, sampling techniques, validity and reliability information, piloting techniques, delimitations, ethical considerations, and trustworthiness of findings. Lastly, a summary of the chapter is provided.

### **3.2 Research Approach**

The purpose of this mixed methods research with a descriptive research design was to investigate the faculty's perceptions of technology integration, the suitability of BBL and their experience of using this learning and teaching tool with their undergraduate students. This study took place at the higher education level in the UAE during the quarantine period brought on by the outbreak of COVID-19. A mixed-method study was selected and adopted in this current study since it was the most suitable design to answer the questions of the research.

A research worldview refers to the research paradigm or the research perspective. It is usually raised by the researcher or a community of researchers that have several insights, beliefs, and values. Johnson and Christensen (2014) stated that the research worldview is a research model or research standpoint that is associated with many researchers based on joint standards, ideas, practices, and expectations.

In this current research, the worldview that was followed was the pragmatic philosophical approach. This approach enables the researcher to integrate useful knowledge for future practices. In addition, this approach focuses on inquiry, practice, and analysis. Ormerod (2006) mentioned

that philosophical pragmatism began in the USA. This philosophy started in the 19<sup>th</sup> century and it has been used and developed after the Second World War. The history and story of the pragmatic philosophical approach were brought by the discoverers and creators – Oliver Wendell Holmes Jr., Charles Saunders Peirce, William James, and John Dewey (Ormerod 2006). However, Giacobbi, Poczwadowski, and Hager (2005) argued that the pragmatic approach was developed and supported by Rorty back in 1982, 1990, and 1991. This philosophy rejected inexperienced ideas. Thus, this philosophical approach works with this present study as it is built on past experiences and real ideas.

The primary impression of pragmatism is that the main guidance to actions is beliefs. Thus, the beliefs should be judged when it comes to the final results rather than judging the principles (Ormerod 2006). The pragmatic philosophical approach was dominating in America and it witnessed progress in the economic, governmental and political domains and made the USA one of the top countries in terms of global power. Besides, the political and the economical awareness of the pragmatic philosophical approach disrupted the educational domain both for the practitioners and researchers.

Pragmatism and the pragmatic researcher have a sensitive inquiry of the following aspects such as social, historical, and political framework (Giacobbi, Poczwadowski, and Hager 2005). Pragmatism is 'the philosophical position that what works in particular situations is what is important and justified or valid' (Johnson and Christensen, 2014, p. 32). As a result, pragmatism works best when the researcher thinks it is most effective to answer the research questions. All data gained as a result will be pragmatic knowledge. In addition, when the theories, plans, actions used in the research are the most suitable for the involved people, it is valid (ibid).

In this current study, the pragmatic approach has been utilized to provide a scientific research practice and solidify it with accurate results at the end of the research. Despite the existence of key criteria and principles in that pragmatic approach that the users can use to differentiate between scientific and non-scientific practices, the objectives and concerns are the keys to judge the final decision (Resnik 2000). Thus, this research focused on the research objective as it is the main key that puts the study on the right track. This study used the pragmatic approach to stress the daily

practices by faculty members. As reported by Giacobbi, Poczwadowski, and Hager (2005), the pragmatic philosophical approach highlights everyday issues practiced by people. There are certain aspects that the pragmatism approach in education has in common with the constructivism and positivism approaches. First is the philosophical foundations, and second, the applications and methods. This current study is interested in these two points which are the philosophical basis, the approaches and the applications.

The inquiry of the research starts with moral standards, integrity, and social honesty. Pragmatism is often with a mixed-methods approach (Giacobbi, Poczwadowski, and Hager 2005). As a result, this approach was selected to highlight what is significantly based on pragmatism and what is working in this practice or situation that should be defensible and valid (Johnson and Christensen 2014). In the end, this research will come up with a better framework to solve the obstacles faced by the faculty.

In social science research, there are four different paradigms to be tracked based on the research questions, objectives, hypotheses, and standpoints. The key paradigms that can be used in social science research are – constructionism, positivism, critical paradigm, and postmodernism. In the present study, two key paradigms were tracked – the positivism paradigm, which is to be measured by the researcher in the study, and the constructivism paradigm, which is to be constructed by individuals in the study. This positivism paradigm is objectively orientated, whereas, the constructivism paradigm is subjectively orientated. In this case, BBL is to be measured through the researcher and individuals as well (Blackstone 2017). Hence, a mixed-methods approach was selected for the faculty at the higher education level in the UAE. The quantitative stage (survey) is built on positivism and the qualitative stage (questionnaire) is built on constructivism.

### **3.3 Data Collection Plan**

In this section, a number of related information is discussed. This includes the scope of the study, the study design, the site investigated, sample and sampling techniques used, the quantitative design, the qualitative design, the procedure of the study, and instruments of the study. This section

also discusses the mixed methods design (Section 3.3.1), and the current research questions (Section 3.3.2).

### **3.3.1 Mixed Methods Design**

In the mixed methods approach, the research should be easy-going, innovative, and flexible. In addition, the mixed methods approach tends to be open to collect any type and exposure to data, including quantitative and qualitative, to find answers for the research questions. The mixed-method approach allows for a fuller, more rounded picture, whereas using mono-methods either the quantitative design or qualitative design alone, data gathered may not be enough to validate the findings. In educational research, there are five (5) major objectives – exploration, explanation, description, prediction, and influence. These educational objectives are applicable and can be used both in the mono-methods or the mixed methods approach. In the mixed design approach, it is common to have multiple objectives of the research (Johnson and Christensen 2014). The current study similarly has multiple objectives which warrant the need for adopting a mixed-methods approach. This ensures that all the objectives can be met.

Mixed design research was employed in the current study to provide a full picture of the research problem. Viewing the research topic from a single point does not add new information to an existing body of literature and it will not add unique information to this field. In the present research, the framework of Greene and colleagues' (1989) was taken into consideration for using a mixed design which suggested that there are five broad rationales to conduct a mixed design – triangulation, complementarity, development, origination, and growth. In this research, the purpose of using the mixed design is triangulation and expansion of the existing body of literature in this field (Johnson and Christensen 2014).

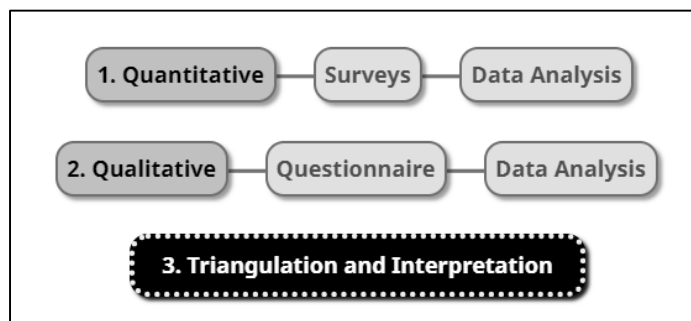
Triangulation is studying the same phenomenon using varied methods to find appropriate answers and to corroborate results. It supports the researcher to compare between results of different tools and hopefully conclude the same finding which allows the researcher to report the statement of the research confidently. "Triangulation can substantially increase the credibility or trustworthiness of a research finding" (Johnson and Christensen, 2014, p.502). Besides, the purpose of using



triangulation for expansion is enlarging the scope and the extent of the research inquiry though using different research methods and adding more input to the current data available in the field.

In this current study, the researcher used a mixed design approach. The procedure of collecting data started with using a quantitative data tool which is the survey instrument. Then, the researcher followed up with several individuals who were willing and interested to provide further information in regards to the research topic. In this second phase, the researcher used a qualitative data tool, which is a questionnaire. Using two types of data tools allowed the researcher to understand the participant's responses in a more comprehensive and holistic manner. Using mixed design strengthens the study and provides a better picture of the study. Quantitative data collected usually highlights the population trends. Whereas, the qualitative data provides detailed information exposing the challenges and opportunities that come along with these trends (Creswell 2012).

The mixed-methods approach covers the concept of technology integration (TI) and the case of BBL from the faculty member's perspectives better than using one method approach. For that reason, the data collected after using the first quantitative instrument needed further clarification. As a result, the use of another method was necessary to get a better understanding of the research problem. Figure 11 illustrates the procedure of the present study. In addition, the mixed design has reached in educational research (Fraenkel, Wallen, and Hyun, 2006). Quantitative design favors numerical and statistical analysis while qualitative design favors the narrative data, such as written communications and detailed information about the research problem.



[Figure 11: Sequential Explanatory Mixed Methods design]

Figure 11 describes the mixed methods design procedures followed in this study. The mixed-methods approach covers a holistic picture of the topic being studied, stressing valid data rather than selective data as mentioned above. Mixed designs have been selected for many reasons as this research design can discover the correlation between the variables and it can provide an explanation of the relationship. Furthermore, a mixed-methods design can help to explore more details of the variables' relationship. Also, it can approve or cross-validate the correlation between the variables (Fraenkel, Wallen, and Hyun 2006).

In spite of the myriad advantage of using the mixed-methods design, there are some drawbacks associated. Firstly, mixed methods design can be time consuming and expensive. Each data tool used in a mixed-methods design needs to be developed. Developing a data tool needs experienced people to analyze it and then the researcher should revise it. Some researchers are not experts in both quantitative design and qualitative design. As a result, the researcher must possess proper skills, valid resources, and enough time to conduct a study using the mixed-methods design (Fraenkel, Wallen, and Hyun 2006). The next sub-sections will describe the quantitative methods (Section 3.3.1.1) and the qualitative methods (3.3.1.2) for the current study in further detail.

### **3.3.1.1 Quantitative Research Method**

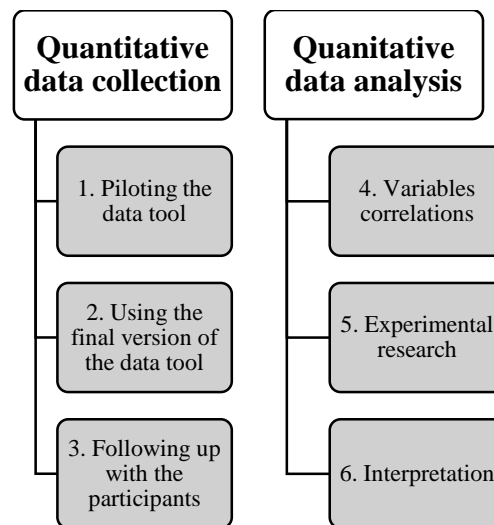
Quantitative data are very important for science inquiries as they provide powerful artefacts and evidence of the research findings and conclusion. The quantitative data collected can be used to examine or approve the theories and expectations of the research (Black 1999). Dimintrov (2013) claimed that the quantitative research approach provides an excellent balance between the conceptual data and numerical translation to arrange for a better understanding of the research concepts. "The quantitative research approach primarily follows the confirmatory scientific method because of its focus in on hypothesis testing and theory testing" (Johnson and Christensen, 2014, p. 33). In addition, a lot of researchers are conducting quantitative research to find out the cause and effect correlations. Thus, researchers will be able to report the expectations and generalizations of the study. Table 1 highlights the assertiveness of this quantitative research.

| The assertiveness of Quantitative research |  |
|--|--|
| <b>Scientific method</b>                   | The selected theories and the four research hypotheses will be tested by analyzing data gathered through the ' <i>confirmatory method</i> '. |
| <b>Ontology [reality]</b>                  | Reasoning by empirical confirming  |
| <b>Epistemology [knowledge]</b>            | Entire Scientific standards  |
| <b>Human Thought and behavior</b>          | Normal and predictable   |
| <b>Research goal</b>                       | Numerical description  |
| <b>Interest</b>                            | Identify specific practices  |
| <b>Focus</b>                               | Testing hypotheses   |
| <b>Type of data collection</b>             | Gather quantitative data using a validated instrument and using precise measurement.   |
| <b>Nature of data</b>                      | Variables  |
| <b>Data analysis</b>                       | Find correlations between variables statistically  |
| <b>Results</b>                             | The findings of the research will be generalizable outside the examination population size.  |
| <b>Final report</b>                        | -Statistical report<br>-Correlations<br>-Statistical findings significance   |

[Table 1: assertiveness of Quantitative research]

All the assertiveness of the quantitative approach is tabulated in Table 1. The research theories and the research hypotheses will be tested by analyzing data gathered through the 'confirmatory method'. The ontology of the research has been tested via empirical study confirmation. The epistemology of the research has been tested through global scientific standards. The expectations of human thoughts in this investigation will be predictable. The numerical data is the research goal. The target of this research is to identify the best practices of technology integration in the higher level of education and the use of BBL. At the end of the investigation, a correlation between the variables will be analyzed.

The research objective is describing an educational technology phenomenon as descriptive research for which the mixed methods approach is suggested. In Figure 12 below, the process of the quantitative data collection (survey) in this present study (See Appendix G) is illustrated. In addition, the research objective is to determine the success or failure of BBL in higher education during the quarantine brought on with the outbreak of COVID-19 based on the point of view of the faculty. Magilvy and Thomas (2009), believed that questions in quantitative descriptive research tend to be simple and straightforward questions that prompt participants' input aligning with slight restrictions to simplify the reflection and inquiry breakdown afterwards.



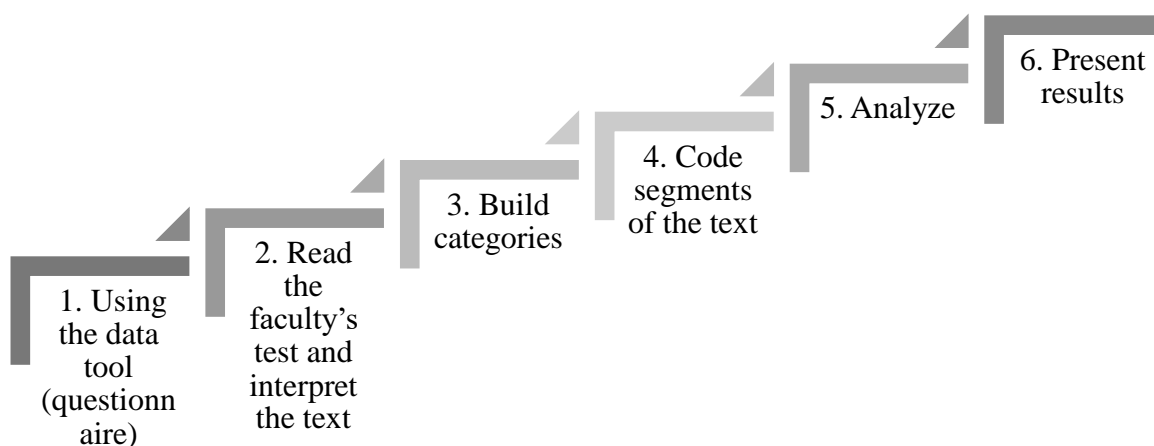
[**Figure 12:** the process of the data collection in this present study]

Figure 12 above illustrates the process of the data collection and analysis for the quantitative data. First of all, a quantitative data tool was developed from a previous data tool to address the research problem and questions of technology integration using BBL. The tool used in the quantitative method was a survey then, the quantitative data is gathered from the key participants of the study and they are the faculty in the higher education level in the UAE. The quantitative data was gathered using an online survey.

### 3.3.1.2 Qualitative Research Method

Qualitative research design can be defined as an approach that studies the individuals' experiences and lends it meaning over a systemic and subjective method. The main goal in the qualitative research study is to have an insight into the phenomenon, explore, enrich it, as well as discover the complexity of the phenomenon. The data analysis technique followed was classifying and ranking data. In the qualitative research method, the researcher obtains data by asking open-ended questions in order to gain in-depth insights from the research participants (Qualitative research designs 2020).

In this current study, a questionnaire has been selected to gather qualitative data from the participants. The data tool was developed from the survey introduced above; however, the questions were developed and written as open-ended questions to gather more information from the participants. The questionnaire was further divided into several themes. It targeted the faculty members who were interested to discuss the topic and give in-depth information about their perception and experience of using BBL. The total number of the participants, in this case, is 14, that is, one from each campus. The process followed in the qualitative research method is shown in Figure 13 below.



[Figure 13: the process followed in the qualitative method]

Figure 13 demonstrates the process followed in the qualitative data collection. The qualitative study started after analyzing the quantitative method input (See appendix H). It started with a follow-up questionnaire with the participants who were interested to provide further clarification of their input in the survey. The data tool, that is, the questionnaire was shared with the participants via e-mail (See appendix G). After completion of this process, the researcher read the questionnaire, comprehended and interpreted its meaning, and built categories based on the input. Thereafter, the categories were coded and analyzed (See appendix I). Lastly, the results were presented in the subsequent chapters of this study.

### **3.3.2 Current Research Questions**

The present research has four research questions as shown in Table 2 below. The first research question, which is the overarching question that guides this study, aims to comprehend the perceptions of the faculty members towards the integration of BBL and its suitability as a main tool of teaching and learning with undergraduate students in the Higher Education level in the UAE, during the quarantine enforced after the outbreak of COVID-19. The remaining questions are more specific questions that have a direct relation to the technology. The second research question aimed to investigate the extent of BBL's usage of these tools for teaching and learning in the chosen institution. The third research question intended to examine the extent to which the external factors are challenging the faculty's technology implementation practices from a technical perspective. The last research question investigated the obstacles the faculty witnessed while using BBL during remote education in the UAE. The research questions, along with the approach, data collection tools, and the population for the study are shown below in Table 2.

A large sample group of participants were included in this investigation in order to provide sufficient data. The research questions needed numeric and narrative information to come to inference with accurate results. Thus, a mixed-methods approach was selected for this research to address the four research question components. The quantitative research approach was chosen to answer the questions of 'who' and 'what'. Whereas, the 'why' questions were answered through the qualitative research approach. In quantitative research, the sample size tends to be a very large

sample. However, in the qualitative research design, the sample size tends to be small. Facts found based on the mixed data collection will be described in graphs, tables, texts, and numbers. The quantitative data will describe the measurement of the practice, whereas, the qualitative data will provide an insight into the teaching practices.

As mentioned earlier in this chapter, two types of data tools were used in this investigation. The first one is an online survey (QUAN purposes) and the second data tool is an online questionnaire (QUAL purposes). Both data tools targeted the faculty members at a public higher education institution. The survey was developed and piloted by the researcher. This survey included 33 questions in total. The questions included in the survey were of three different kinds. It included closed or fixed response questions, yes or no questions, and open-ended questions. A total of 29 questions were rating scales that required interval data. Two questions were dichotomous in nature, that is, yes or no questions, which required logical data. Two other questions were open-ended questions that required a detailed text response. Such data tools and questions were expected to reveal the validity and the cogency of the faculty's input to support the final findings of the study and underline the study recommendations as well.

The questions created for the questionnaire were inspired by the survey itself but with one type of question, which is an open-ended question. The questionnaire included 17 questions in total. The participants were asked to give detailed answers as they started the process of filling up the questionnaires. Such detailed responses ensure that in-depth information can be extracted from the responses. Such in-depth data will add more sense and explanation to the numeric data gathered using the survey. It would be significant if the faculty's perspectives in the survey match the faculty's perspectives in the questionnaire as well as with the previous studies.

| <b>Research Question</b>  | <b>Research Approach</b>    | <b>Data Collection Method</b>                                     | <b>Target Population</b> |
|---|-----------------------------|---|--------------------------|
| <b>Main Research question</b>   |                             |   |                          |
| How technology integration in higher education is occurring in the UAE? And how | Qualitative<br>Quantitative | <ul style="list-style-type: none"> <li>• Questionnaire</li> </ul> |                          |

|  |              |   |  |
|--|--------------|---|--|
| do faculty members perceive the usability of BBL?  |              | <ul style="list-style-type: none"> <li>• Survey</li> <li>• Literature review</li> </ul> | <ul style="list-style-type: none"> <li>• The small scale of faculty</li> <li>• A large scale of faculty</li> </ul> |
| <b>Specific Research question</b>  |              |   |  |
| What are the trends and developments accounted for in the literature on technology integration in higher educational institutions in the UAE?  | Quantitative | <ul style="list-style-type: none"> <li>• Literature review</li> </ul>                   | <ul style="list-style-type: none"> <li>• N/A</li> </ul>  |
| <b>Research Question 1:</b> How is BBL used to realize the technology integration in the higher educational institutions in the UAE?   | Quantitative | <ul style="list-style-type: none"> <li>• Questionnaire</li> </ul>                       | <ul style="list-style-type: none"> <li>• A large scale of faculty</li> </ul>                                       |
| <b>Research Question 2:</b> What are the experiences and perspectives of faculty members on the usability of BBL<br><b>Research Question 3:</b> What are the experiences and perspectives of faculty members on the usability of BBL | Qualitative  | <ul style="list-style-type: none"> <li>• Questionnaire</li> </ul>                       | <ul style="list-style-type: none"> <li>• The small scale of faculty</li> </ul>                                     |

[**Table 2:** research questions and chosen approach, data collection and targeted population]

The mixed design approach was adopted because it is the most useful design to address the research questions. In addition, it assists the researcher to compare the data collected and implement the triangulation protocol. Thus, combining two methods will be beneficial in invalidating the final results. Also, each of the qualitative and quantitative methods has particular weaknesses and strengths. Combining the two methods ensured that the drawbacks of one method can be compensated with the advantages of the other, thus creating solid research based on strong points (Qualitative research designs 2020).



The quantitative research approach design implemented in this study is concerned with testing the research hypothesis and checking the cause and effect relationship in this current research. Moreover, it assists the researcher to find a correlation or causation between variables in the research. In addition, it assists to generalize the data gathered from the sample size and measures the opinions given by the targeted population who were the faculty. Besides, the quantitative research approach can be completed effectively and quickly. KamolsonSu (2007) claimed the quantitative research approach is free of value as statistical facts that cannot be biased. Lastly, the rationale of choosing this research design is in agreement with KamolsonSu (2007) who claimed that reality in the quantitative research approach is objective and often eludes the researcher.

The qualitative research approach, on the other hand, relies on non-numeric data such as written text or pictures enriched with detailed descriptions. As mentioned by Johnson and Christensen (2014), the key aim of the qualitative research approach is the exploration or discovery of data. In addition, this type of research approach is usually studying the topic of the research in its nature without the need for controlling or manipulating the variables. In the qualitative research method, the researcher acts as an author or detective in asking the questions and goes over the relevant parts and asks further questions to get more information. Also, it takes a longer time than the quantitative research approach (ibid).

### **3.3.3 Site Investigated**

The current study focuses on one higher education institution only. However, this institution has fourteen (14) different campuses located across the UAE. The campuses are located in varied emirates across the UAE, including Abu Dhabi, Al Ain, Ruwais, Madinat Zayed, Dubai, Sharjah, Fujairah, and Ras Al-Khaimah. The students and faculty include both men and women. This chosen educational institute is a public higher education institution for UAE national students. This institution has implemented information and communication technology since 1988.

The faculty members teaching in this institution are from different nationalities, majors, genders, years of experience, as well as different campuses. All faculties were e-mailed to participate in this

study. The main e-mail was sent from the researcher to the Executive Dean of the Education division in the Abu Dhabi Campus (See appendix E). This email included all the information required along with the link to the survey. Then, another e-mail was sent to all faculties in this institution including the Executive Dean Office (See appendix F). Prior to both the set of e-mails, approval was gained from the research committee at this institution (See appendix D) and a permission form BUID (See appendix C).

Several emails were sent from the researcher to the Executive Dean of the Education Department in Abu Dhabi Campus to follow up with the faculty who are willing to add further information on the same topic via an online questionnaire. The total number of faculty who received the e-mail was 1,200, including both males and females from the fourteen (14) campuses. However, only 329 faculties completed the survey e-mailed from the Executive Dean Office. A total of 14 faculty members were interested to give further information and participate in the qualitative assessment of the study.

### **3.3.4 Samples and Sampling Techniques Used**

The idea behind sampling is to choose a small and representative group of people out of the whole group. Based on their input, researchers find a conclusion on a certain topic. Sometimes, the conclusion is accurate and sometimes it's not precise. Thus, the most essential phase in the research procedure is the selection of the research sample. Fraenkel, Wallen, and Hyun (2006) opined that sampling is a key procedure where the researcher selects the individuals to represent the whole group, that is, the population. In this study, the population is 1,200 faculty members, the sample size of the survey was large (more than 30), consisting of 329 faculty members, and the sample size of the questionnaire was small (less than 30), consisting of 14 faculty members.

There are two types of sampling, for example, random sampling and non-random sampling. In random sampling, the participants have an equivalent chance to be selected in the study; whereas, in the non-random sampling, the participants have no chance or zero chance to be selected.

Hence, simple random sampling (SRS) was selected for this investigation. In this type of sampling, every single member of the whole population has an independent and equivalent chance to be chosen to represent this study. The larger the size of the random sampling is, the further representative it will be of the population. Even though there are no assurances of the representation, previous studies showed that the larger the random sample is more likely it is to represent the population (Fraenkel, Wallen, and Hyun 2006).

### **3.3.5 Quantitative Design Participants - Survey**

The targeted population of this study is all the faculty members who are teaching in the fourteen (14) campuses around the UAE in this institution. As mentioned above, the total number is 1,200 faculty members. Whereas the sample used in quantitative design (survey) was a total of 329 faculty members from all campuses (14), and 14 faculty members were involved in the qualitative design (questionnaire). As mentioned earlier, the advantages of simple random sampling are the accurate representation of the population on account of the large sample size. However, it has a disadvantage, which is including all the population in the study since it is challenging to analyze all the members (Fraenkel, Wallen and Hyun 2006).

### **3.3.6 Qualitative Design Participants - Questionnaire**

The target population for the qualitative part of the study was also the permanent faculty members from this recognized higher education institution of the UAE. A member from each campus participated in the qualitative assessment process. Thus, the total number of the questionnaire participants was 14 faculty members from fourteen (14) emirates of the UAE and they have been given codes for each emirate. For example; Abu Dhabi Women's was coded as ADW and Dubai Men's was coded as DBM. Thus, the codes for the campuses were the following and they were all included in the survey are – ADW, ADM, AAW, AAM, DBM, DBW, SJW, SJM, MZC, RUC, RKW, RKM, FJW, FJM (as shown in Table 3).

### **3.3.7 Procedure of the Study**

A total of 329 faculty members were surveyed from these different campuses. All of the participants in the survey were in a permanent status of employment in current conditions of coronavirus. They have moderate to high computer literacy and proficiency, and experience of using BBL in higher education. This criterion allowed for a reasonable response and feedback from users of technology integration and the use of BBL. The sample focused on key aspects of knowledge and learning. The percentage of each campus was seen to be varying as shown below in Table 3.

**Where do you work?**

|           | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------|-----------|---------|---------------|--------------------|
| Valid ADW | 1         | .3      | .3            | .3                 |
| DBM       | 1         | .3      | .3            | .6                 |
| AAM       | 17        | 5.2     | 5.2           | 5.8                |
| AAW       | 28        | 8.5     | 8.5           | 14.3               |
| ADM       | 44        | 13.4    | 13.4          | 27.7               |
| ADW       | 49        | 14.9    | 14.9          | 42.6               |
| DBM       | 37        | 11.2    | 11.2          | 53.8               |
| DBW       | 24        | 7.3     | 7.3           | 61.1               |
| FJM       | 8         | 2.4     | 2.4           | 63.5               |
| FJW       | 26        | 7.9     | 7.9           | 71.4               |
| MZC       | 2         | .6      | .6            | 72.0               |
| RKM       | 5         | 1.5     | 1.5           | 73.6               |
| RKW       | 19        | 5.8     | 5.8           | 79.3               |
| RUC       | 8         | 2.4     | 2.4           | 81.8               |
| SJM       | 12        | 3.6     | 3.6           | 85.4               |
| SJW       | 48        | 14.6    | 14.6          | 100.0              |
| Total     | 329       | 100.0   | 100.0         |                    |

**[Table 3: participants' sites]**

As shown in Table 3, out of the 14 campuses in the UAE, the majority belonged to the two different Emirates of Abu Dhabi Women's (ADW). This accounted for 49 out of the 329 participants. This was followed by Sharjah Women's (SJW) which had 48 participants and Dubai Men's (DBM) which had 37 participants. The percentage of participants from each site showed that ADW had 14.9%, SJW had 14.6%, and DBM had 11.2%. All the campuses of this higher education organization were well-diversified and spread out across the different Emirates of the UAE.

This phase of the study is conducted based on a quantitative research method. The total number of participants in this quantitative research who responded to the revised BBL survey was 329 faculty members. These participants were the representatives of this higher education organization, all the fourteen campuses in the UAE. The gender details of the research sample are tabulated in Table 4 below.

| <b>Gender</b> |           |         |               |                    |
|---------------|-----------|---------|---------------|--------------------|
|               | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid Male    | 204       | 62.0    | 62.0          | 62.0               |
| Female        | 125       | 38.0    | 38.0          | 100.0              |
| Total         | 329       | 100.0   | 100.0         |                    |

[**Table 4:** Gender details of the research]

The gender of the population was skewed in favor of males members, which accounted for a total of 204 participants compared to 125 female candidates. This can be reflective of the fact that the majority of educators and professors in institutes for higher education in the United Arab Emirates are male. Alternatively, it can also reflect the fact that males were more interested in being part of this study. Histogram of candidates' genders shows the disproportion and difference between the two genders. However, the gender of faculty members was not considered to be a key determinant or variable for the whole survey. Therefore, the sampling was not based on a stratified approach for equal representation of gender. The second important characteristic of the population is their total teaching experience as shown in Table 5 below.

### Total teaching experience

|           | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------|-----------|---------|---------------|--------------------|
| Valid 0-5 | 27        | 8.2     | 8.2           | 8.2                |
| 5-10      | 42        | 12.8    | 12.8          | 21.0               |
| 10-15     | 57        | 17.3    | 17.3          | 38.3               |
| 15-20     | 83        | 25.2    | 25.2          | 63.5               |
| >20       | 120       | 36.5    | 36.5          | 100.0              |
| Total     | 329       | 100.0   | 100.0         |                    |

**[Table 5: Participants teaching experience]**

Teaching experience is the second question aimed at determining the demographic characteristics of the research participants. As shown in Table 5 above, these numbers do not consider their experience of online education or BBL. It is their total teaching experience in higher education. The data summarized in Table 5 shows that faculty members with higher experience constituted a greater proportion of the whole population. Table 5 above shows that the majority of the participants had an experience of greater than 20 years. A total of 120 faculty members were well-experienced in both traditional and online methods of teaching and learning. An increasing trend can also be observed in the histogram. A total of 120 participants had a teaching experience of more than 20 years compared to only 27 with an experience of fewer than 5 years. A total of 42 participants had teaching experience of five to ten years. A total of 57 participants had teaching experience of ten to fifteen years. A total of 83 participants had a teaching experience of fifteen to twenty years and this is the second-highest number of participants. Table 6 shows the mean and the median of the total teaching experience.

### Statistics

#### Total teaching experience

|        |         |      |
|--------|---------|------|
| N      | Valid   | 329  |
|        | Missing | 0    |
| Mean   |         | 2.69 |
| Median |         | 3.00 |
| Mode   |         | 4    |
| Range  |         | 4    |

[Table 6: statistics of teaching experience]

As shown in Table 6 above, the total teaching experience had a mean of 2.69 with the most repeated value (mode) of 4, and it was the highest value of the input representing an experience of greater than 20 years. It enhances the reliability of data because most participants have experienced both traditional and modern methods of education and can integrate teaching at the higher education level. Whereas, the total teaching experience had a median experience of 3.00, which is the average of the two middle values after all values were catalogued.

### 3.3.8 Questionnaire Participants

A small scale of participants was involved in this qualitative research method phase of the study. A total of fourteen (14) faculty members were involved in this study. One faculty member from each campus was willing to give further information, as the following ADW, ADM, AAW, AAM, DBM, DBW, SJW, SJM, MZC, RUC, RKW, RKM, FJW, and FJM. The whole sample size of the participants in the questionnaire had the same criterion as the survey participants. This implies that they were permanent employees during the pandemic of COVID-19; they have good technical knowledge, teaching and learning expertise, and practice of use of BBL in higher education daily. This criterion drives a meaningful response to build valid findings of the topic of technology integration and the use of BBL at the end of the study. Three (3) females and eleven (11) males participated in the questionnaire.



### **3.4 Instruments of the Study**

There are many instruments available for the researchers to use in order to gather the necessary information. The choice of instrument is determined based on the nature of the research questions and/or objectives that underpin the study. The information required for this study needed an exceptional and unique set of questions to address the research objectives. Data tools differ from an organization to another and from a particular individual to another. All of these elements can affect the research instruments as well as the period of the study, the circumstances, and the event surrounding the research (Colton and Covert 2007).

In this research two data tools were used to gather the data. The first data tool is a survey. It was retrieved from the previous related study conducted by Mundy, Kupczynski, and Kee (2012). The second data tool is a questionnaire that was retrieved from the same study conducted on the topic of technology integration. The original survey was based on technology integration in the classroom. However, it was developed to address the use of BBL in higher education from the faculty member's perspective.

Both the developed survey and questionnaire tested four main themes of technology integration (TI) with reference to BBL. The themes include – the use of BBL in teaching and learning, the process of integrating BBL into teaching practices, the potential utilization of BBL, the possible technical challenges the faculty may face, the obstacles, and best practices in BBL based on the faculty experiences.

#### **3.4.1 Survey – Quantitative Design**

The survey is based on a set of questions to capture the respondents' input which is, opinions, ideas, or experiences, in a standardized way. This present quantitative study is conducted using a developed survey inspired by a technology integration survey created by Mundy, Kopczynski, and Kee back in 2012. The developed survey was adjusted to address the particular nature of BBL in higher education during the quarantine of COVID-19, which is the focus of this current study. This survey was chosen due to the validity and reliability that were tested earlier by the creators of the

original survey by Mundy, Kupczynski, and Kee (2012). In addition, this survey was chosen because it is similar to the topic of the research. Besides, it is efficient, and therefore, will lead to accurate findings.

Questions of the survey were consistent, categorized in varied themes, and written using very clear and simple language to enable all respondents to comprehend the questions with ease. The lucid and precise nature of the language of the questions also minimized the possibility of misinterpretation of the questions. Thus, the respondents could read, understand the questions, and respond to the questions without doubting the meaning of the questions. As reported by Creswell (2012), surveys are a very powerful data collection tool as they allow the researcher to introduce the questions in the same order and follow the same formatting of questions for the respondents of the survey. This ensures that bias can be minimized.

Johnson and Christensen (2014) stated that the main objective of a survey is to gather data of the participant's feelings, intentions, beliefs, personality, and behaviors. If the data collection tool is not designed well or not selected well, then the research findings will be worthless and pointless (ibid). In addition, the survey is an excellent tool to collect data remotely. This survey is user-friendly because respondents enjoy the convenience of time and place. This implies that the respondents had the freedom to answer the survey at any time and from any place, as per their convenience. This current survey was an online survey created using Google Forms.

Online surveys have advantages as well as disadvantages. The advantage of the online survey is that Google Forms is a free tool, which implies that there is no cost involved on part of the researcher. In addition, data from online surveys can be collected instantaneously. This is because the researcher can start getting the participants' responses immediately after sharing the online survey link. The size of the sample can be large and all participants have the liberty of responding at their convenience. Furthermore, an online survey decreases the human efforts needed to collect and then analyze the data. The online survey protects the participants' privacy which may allow them to write an honest response (Smyth, and Pearson 2011). On the other hand, an online survey has the potential to increase human errors regarding data processing.

Most of the faculty members have integrated technology into their daily practices of teaching and learning in higher education. Their practices can be evaluated through the use of BBL especially at the higher education level. Ertmer et al. (2012) mentioned that finally, technology was integrated to the fullest for many reasons. First of all, technology resources are ready to be used and accessed anytime and anywhere.

The stakeholders provided intensive training for teachers and are fully aware of the importance of training. Besides the ongoing related to promising technology integration ensures that all educational sectors either private or public are using a high level of technology such as BBL, Microsoft Teams, Zoom, and Moodle. Every day, On the other hand, there may be barriers in this stage of technology implementation such as the faculty's pedagogical beliefs. Teacher's beliefs play a huge role in the use of technology. This gap directed the research to conduct this survey to gather the faculty member's beliefs, experiences, and thoughts and analyze those beliefs and thoughts to come up with a good model of technology integration using BBL (Ertmer et al. 2012).

The original survey created by Mundy, Kupczynski, and Kee (2012) was utilized in research published from the University of Tetova in North Macedonia in 2012. This survey was targeted the school's practices and the key participants were the school teachers. Forty (40) school teachers were involved in this study. The research was conducted using the survey of technology integration and it procured interesting findings.

The findings of that research suggested that 52.5% of the participants believed that the technology used in the classroom improved the learning and teaching process. Whereas, 47.5% of the participants believed that integrating technology in the classroom was not developing the teaching and learning process. The last question of that research was, "is technology helpful in the classroom" and it was one of the key research questions. As mentioned above, the total number of participants was 40, a total of 26 participants agreed that the technology is helpful and the remaining 14 participants disagreed and found technology not helpful (ibid).

The present study utilized the technology integration original survey that was created by Mundy, Kupczynski, and Kee (2012). In order to make the original survey suitable for this present study

that focuses on the use of BBL, varied modifications were made to address the specific demands of this topic. The topic of the research is the suitability of using BBL for the faculty members in a higher education institute in the UAE during the COVID-19 pandemic. The modified survey went through a pilot using a small number of faculty members as participants to ascertain the feasibility of an instrument prior to the large scale study.

The survey consisted of five sections. Before these five sections, brief introductory information was given about the research and the researcher for the respondents, as well as an explanation of their rights in this study. Then, three demographical items were presented; ‘Where do you work?’, ‘Your gender?’, and ‘Total teaching experience?’ Then, a total of 33 questions were given to the respondents regarding the topic of study.

**Section 1:** This section measured the variable faculty usability of BBL and the use of BBL in teaching and learning during the COVID-19 quarantine. It composed of 12 items and the responses were based on a Five-Point Likert scale. A number of statements were written for the respondents and they were asked to choose the most accurate answer based on their experience. The items in this section of the survey included – BBL meets the teaching objectives, it helps the faculty to collaborate with others, it helps the faculty to interact with students, it improves the faculty communication skills, it allows the faculty to be a learning facilitator, it provides the faculty with easy and quick access to instructional materials, it eases the pressure of preparing teaching materials on the faculty. Other items included in the survey were that – BBL motivates faculty to create more engaging student-centered learning activities and BBL enhances the amount of Wi-Fi connection stress and that BBL makes classroom management more difficult in the remote learning set-up. One question was written with a negative connotation; it was that BBL cannot accommodate faculty’s personal teaching styles. Faculty members were requested to specify their level of agreement with a number of statements on an ordinal scale of 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree and 5 = Strongly Agree.

**Section 2:** This section measured the variable BBL integration and the process of integration by the faculty members. It consisted of 10 items based on a Five-Point Likert scale. Faculty indicated the extent to which BBL tools are integrated into their daily practices. The main points of this

research are – integrating E-Textbooks, integrating communication tools such as discussion board, integrating organizational tools such as calendar, analytical tools like Grade book, recreational tools such as games, interactive audio-visual tools such as YouTube, expressive tools as Microsoft Word processing, evaluation tools such as assignments, assessments such as save-and-sign, and informative tools such as Web-links. Faculty were questioned to designate their level of likelihood with a number of statements on a scale of 1 = not at All, 2 = to a small extent, 3 = to some extent, 4 = to a moderate extent, and 5 = to a large extent.

**Section 3:** This section measured the variable BBL external factors that are challenging technically into the teaching and learning practices. It consisted of 2 items based on a Five-Point Likert scale. The main points of this section are the internet connection and the availability of BBL support staff. Faculty were asked to specify their level of likelihood with a number of statements on a scale of 1 = not at All, 2 = to a small extent, 3 = to some extent, 4 = to a moderate extent, and 5 = to a large extent.

**Section 4:** This section measured the variable of few conditions within the use of technology and BBL during quarantine. It consisted of 5 items based on a Five-Point Likert scale. The main points of this section are the following – using BBL will create less social interaction, using technology in BBL takes so much time, BBL can help faculty develop and adopt new teaching techniques, BBL threatens faculty, and using BBL enables the faculty to be a guide and direct the students. Faculties members were requested to indicate their level of agreement with a number of statements on an ordinal scale of 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree and 5 = Strongly Agree.

**Section 5:** This section measured the variable obstacles and best practices in BBL. It consisted of 4 items using two types of questions, 2 yes-no questions and 2 open-ended questions. The key points in this section are the following – the challenges that the faculty faced during quarantine and the best practices of technology integration.

### **3.4.2 Questionnaire – Qualitative Design**

The questionnaire collected data via a self-based instrument completed by the participants in the study. Researchers use this type of tool to get the participant's behavioral plans, attitudes, personal natures, emotional states, ideas, standards, and insights. This implies that the main goals of the research differ from one researcher to another. The main aim of the questionnaire is to understand the participant's opinions on the research variables. The researcher should come up with clear questions to enable the participants to express their experiences and their thoughts clearly (Johnson and Christensen 2014).

There are several principles required to construct the questionnaire. The first principle is assuring that the questionnaire matches the research objectives. The second principle is the researcher should create an empathetic understanding of the participants. The third principle is using a simple and familiar language. The fourth principle is writing short and clear questions. Principle number five is to avoid using any leading questions that suggest a specific answer for the participants. Principle number six is avoiding using double-barreled questions which have two matters or more in the same question. The seventh principle is avoiding including two negatives in the same question. Principle number eight is to determine what each question required either open-ended or closed-ended questions (Johnson and Christensen 2014).

The questions of the questionnaire and its design are very important because they can determine the success or the failure of the study. Therefore, it should be well-designed. The goal of the questionnaire is to ask the respondents more related questions about the research topic and more questions related to the first data tool, which is the survey. In the questionnaire, the respondents are expected to give more details and longer answers to give the researcher a clearer understanding of their experiences and allowing the respondents to elaborate on their feelings and opinions. In addition, the questionnaire should not be used to ask about product or service, it should be used to ask about general information, practice, or experience, to avoid any bias (Ndukwu 2020).

The design of the questionnaire utilized in this study was inspired by the original survey created by Mundy, Kupczynski, and Kee (2012). The survey has five (5) different themes whereas, the

questionnaire has four (4) different themes. The questionnaire has 21 questions and all of the questionnaires are open-ended questions. The main goal of this questionnaire was to getting more of the respondents' insights and views to have a better understanding of the research problem and questions. The key points of this research include the faculty views on the use of BBL during the pandemic, the faculty readiness and motivation on technology integration, the faculty role in the process of integration, the obstacles faced by faculty and best practices in BBL.

**Section 1:** This section measured the variable related to the use of BBL during the pandemic. It consisted of 4 items using open-ended questions. The key points of this section are – how the BBL was used during the quarantine, what are the faculty purposes, the faculty views of BBL with a justification, and how the BBL was used during lockdown due to COVID19 in the UAE.

**Section 2:** This section measured the variable faculty readiness and motivation on technology integration. It consisted of 5 items using open-ended questions. The key points listed in this section are the following – faculty motivation to create more engaging learning activities using BBL tools, Blackboard Lean tools that motivate the students to learn, student-centered activities, the use of technology, and how prepared are faculty to use BBL to the fullest.

**Section 3:** This section measured the variable faculty role in the process of integration. It consisted of 6 items using open-ended questions. The key points listed in this section are the following – the factors that impact the utilization of BBL internally and externally, Blackboard tools that are used frequently and the tools never used, the most tools used to communicate with students, the tools used to evaluate students' work, the procedure faculty follow to integrate technology in the remote education.

**Section 4:** This section measured the variable BBL's obstacles and best practices. It consisted of 5 items using open-ended questions. The main points listed in this section are the following – the obstacles the faculty face with integrating technology and using BBL during the quarantine, other digital technologies do you use and have used in the classroom to support student's learning in the remote learning, comments about the use of BBL during the pandemic of COVID-19, and further comments about the technology integration.

### 3.4.3 Reliability

The responses to both instruments revealed no unfinished questions as the questions were designed to be completed. This implies that the respondents were not able to submit their response sheet unless it was completed. No invalid responses were submitted. The analysis of the research reliability showed an acceptable score of Cronbach's alpha which 0.901 (as shown in Table 7). That high score of Cronbach's alpha shows that the instrument used in this study is highly reliable.

| Reliability Statistics |  |            |
|------------------------|--|------------|
| Cronbach's Alpha       | Cronbach's Alpha Based on Standardized Items | N of Items |
| .901                   | .905   | 10         |

[Table 7: Cronbach's alpha]

Cronbach's alpha in this study was 0.901 which shows that the study is highly reliable. Cronbach's alpha is the inner consistency or it presents how the study is presenting well what it should present (Bonett & Wright 2014). In this Figure 11, Cronbach's Alpha was measuring the integration of the technology of section 2 in the survey. It shows how accurate the survey measuring the variables. It also indicated that the variables in the survey are highly correlated.

The inner consistency was measured by Cronbach's alpha as it is frequently used to test reliability. Cronbach's alpha can be affected by the study span, extent, and dimensionality. In addition, Alpha is key in testing reliability because it has to track the expectations of the basic tau-equivalent method. A high alpha means the expectations are met. Whereas, a low alpha means the expectations are not meet. Alpha does not measure homogeneity and unidimensionality only, it tests the research length. When the test is longer the reliability of the test increases no matter if the test is homogenous or not. When the test is shorter, it can affect the reliability and make the test



less reliable (Tavakol & Dennick 2011). As a result, before conducting the study, it is highly important to confirm the internal consistency. As shown in Table 8, an outline of the reliability per subscale.

| <i>Subscales</i>                                 | <i>Cronbach's alpha <math>\alpha</math></i> |
|--|---|
| The Usability of BBL During the Quarantine       | .734  |
| The integration of BBL During the quarantine     | .901  |
| BBL external factors are challenging technically | .761  |
| Faculty Role with BBL                            | .801  |
| Total scale                                      | .840  |

[**Table 8:** reliability of BBL scales]

The required value of Cronbach's alpha ( $\alpha$ ) is 0.65 and above in any scientific research. For the reason that this value makes the reliability test credible and makes the results of the research appropriate (Streiner, Norman and Cairney 2015). This current study has a value in the total scale of Cronbach's alpha ( $\alpha$ ) of 0.84 and the value of the subscales ranges from 0.734 to 0.901. On the other hand, Tavakol & Dennick (2011), claimed that a high value of alpha ( $> 0.90$ ) can submit dismissals and it recommends to make the test length shorter.

#### **3.4.4 Design of Revised Technology Integration (TI) Survey and Questionnaire**

The revised survey was retrieved from the survey of Mundy, Kupczynski, and Kee (2012). The original survey was designed to measure the implementation of technology integration at the schools level based on the teachers' experiences. The amendment of the original survey was based on the higher education context, the United Arab Emirates (UAE) context, the faculty context, and the current situation of remote learning due to the pandemic of COVID-19.

First of all, a brief overview of the purpose of the study was provided at the very beginning of the survey to inform the participants of the research topic and questions. The identification number of the employee was deleted to assure that all participants' personal information was anonymous. All infographic details were changed to the dropdown menu. The statement of each section was reformulated to assure the clarity of questions. The first question was about performance and achievement which are two key points' completely different points in the same question. Thus, question number one was divided into two separate questions. Many questions in the first section of the survey were reformulated to suit the case of BBL.

In the second section, an adjustment of the question text was made to the answer options offered. Instead of asking "how frequently", "agree or disagree" options were included. In the third section, all tech skills questions were replaced with BBL questions. For example, 'Faculty's lack of experience with technology was changed to 'Faculty's lack of experience with BBL' in all the survey questions. The format of section four was different, as it was designed as a multiple-choice question. The format of the question was changed to be consistent with the previous questions. Some of the questions were written in negative language. For instance 'BBL Cannot accommodate faculty's teaching styles' to assure that the respondents will read the questions carefully and they were informed in the introduction of the survey.

In the questionnaire, some major changes were made. All of the questions were changed to elicit longer answers and allow the respondents to elaborate on their thoughts. All of the questions were inspired by the survey itself but the questions were articulated differently. The structure of the questions was designed to be consistent with the previous questions. A total of 17 questions were created in the questionnaire.

### **3.4.5 Validity**

Both instruments used in this study went through two validation procedures. The first one was sought experts' review of both instruments and the second procedure was piloting the instrument.

A number of experts were involved in this stage. Validation procedures are in detail in the following sections.

Validity depends on the evidence provided by the researcher after collecting data, it can be the quantity (amount) of evidence or the category (format) of evidence to enrich the analyses. There are three main types of evidence that can be collected, for example, content-based evidence, principle-based evidence, and construct-based evidence of validity (Fraenkel, Wallen & Hyun 2006). In the current research, the type of evidence was collected is the construct-based evidence of validity.

Construct-based evidence of validity is the broadest and the biggest category among the three types of validity. Construct-related type of validity refers to the characteristic nature of individuals that is measured using the instrument. Besides, it can be the psychological construct of the sample size in the study. This construct must describe the dissimilarities between the individual's behaviors and their performances on specific tasks such as integrating technology through the use of BBL. In this type of validity, the researcher collects varied types of evidence rather than collecting a single type of evidence. The more varied the pieces of evidence are, the better the validity is; because collecting varied pieces of evidence will lead the study to a clear conclusion (Fraenkel, Wallen & Hyun 2006).

In order to achieve construct-related evidence of validity, there are three steps that need to be followed. First of all, there should be clarity of definition. The study variables should be defined and explained very well. Secondly, there should be clarity of the hypotheses and theories of the study. The hypotheses of the study which are connected with fundamental theory and the variables of the individual's own behaviors were included. A comparison of the individuals' behaviors was completed to discover the most versus the least behaviors in specific conditions. The third step is the hypotheses of the study that should be tested in two different ways, such as empirical way and logical way. In this present study, technology integration and BBL was first defined. Then, the researcher formulated the theory underlying these two concepts and compared the individuals' behaviors using technology, and who is using it a lot versus who is using it a little (Fraenkel, Wallen & Hyun 2006).

However, question 1 (item 1) which is ‘supports faculty in meeting their teaching objectives’ with different questions measured varied scores. For example, the correlation between question 1 (item 1) and question three (item 3) had a high correlation score of (0.611), which was the strongest correlation. The correlation of question five (item 5) which was ‘allows faculty to be learning facilitator instead of an informational provider’ had a strong correlation also because the score of correlation between (item 1) and (item 5) was (0.554). Similar to question four (item 4), ‘Develops faculty communication skills’ had a strong correlation with question one (item 1).

In contrast, some of the correlation scores were weaker such as the correlation between question 4 (item 4) and question 2 (item 2) with a score of (0.185). Also, the correlation score between question 6 (item 6) and question 3 (item 3) was low, a 145. The correlation between question 8 (item 8) and question 6 (item 6) was the lowest, and the weakest correlation and the score was (0.080). There were minor cases of low correlation in all dimensions of this study, meaning overall, the questions of the study were greatly correlated. See table 9 below.

| Correlation Matrix |   |  |   |   |   |   |  |   |  |
|--------------------|---|--|---|---|---|---|--|---|--|
|                    |   | Supports faculty in meeting their teaching objectives. | Enhances faculty interaction with students. | Cannot facilitate faculty collaboration with other faculty. | Develops faculty communication skills (e.g., writing feedback and presentation skills). | Allows faculty to be a learning facilitator instead of an information provider. | Limits the faculty's choice of instructional materials (e.g., E-text books). | Provides the faculty with an easy and quick access to instructional materials (e.g., E-text books). | Eases the pressure of preparing teaching materials on the faculty (e.g., Reusable learning content). |
| Correlation        | Supports faculty in meeting their teaching objectives.                                  | 1.000  | .611  | -.301   | .535  | .554  | -.247  | .551  | .297   |
|                    | Enhances faculty interaction with students.   | .611   | 1.000                                       | -.233   | .591  | .560  | -.145  | .516  | .396   |
|                    | Cannot facilitate faculty collaboration with other faculty.                             | -.301  | -.233                                       | 1.000   | -.185   | -.214   | .450   | -.262   | -.141  |
|                    | Develops faculty communication skills (e.g., writing feedback and presentation skills). | .535   | .591  | -.185   | 1.000   | .571  | -.153  | .517  | .281   |
|                    | Allows faculty to be a learning facilitator instead of an information provider.         | .554   | .560  | -.214   | .571  | 1.000   | -.213  | .414  | .250   |

[Table 9: Correlation Matrix]

In this study, a principal component analysis (PCA) was undertaken due to the large data gathered and the challenges to interpreting this amount of dataset. PCA is a method used to decrease the

dimensionality of large data, make it easier to interpret as well as saving the information gathered. Table 9 above shows the ‘correlation matrix’. Some values were equal to or greater than (0.3). Technically, each item with itself should have a perfect correlation. The value of the correlation between the item and itself usually is (1.000) and this was the case in this study. The variables uncorrelated, were the ones that had values less than (0.3) and they can be either kept or removed such as these two variables (item 1) 'supports faculty in meeting their objectives and (item 23) 'availability of Blackboard support staff' in which the correlation value between the two variables was (.180).

In addition to that, there were some negatively coded variables because there were some negative variables that indicated negative values and in theory, they had a positive correlation. For example, the correlation between these two variables (item 2) 'cannot facilitate faculty collaboration with other faculty and (item 1) 'Supports faculty in meetings their teaching objectives' and their correlation value was ‘-.301’. All research items were correlated. Accordingly, there was no need to eliminate any of the research questions in this study of data analysis. The value of KMO is considered as well as shown in Table 10 below.

| KMO and Bartlett's Test                          |                    |          |
|--|--------------------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. |                    | .912     |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | 4418.700 |
|  | df                 | 406      |
|  | Sig.               | .000     |

[Table 10: KMO and Bartlett's Test]

The KMO refers to the Kaiser-Meyer-Olkin and it measures the sampling adequacy. Bartlett's test, on the other hand, measures the sphericity. The statistic of KMO differs from 1 to 0. The statistic of KMO in this data was (0.912) which is close to 1. As reported by Norman (2011), mentioned that when the value of KMO is near or close to (1) it means that the correlations alignments are fairly solid and the PCA should return reliable elements. Based on Kaiser's suggestion KMO test should be more than (0.5), any values below than (0.5) should include other variables or should gather some more data. In this study, the KMO test falls at (0.912) which is an acceptable value.

As stated by Norman (2011), any values above (0.9) are acceptable which means the principal component analysis is appropriate for these data.

The null hypothesis is measured in Bartlett's test. In the null hypothesis, the original correlation matrix could be the identity matrix. Some relationships between variables are needed in the principal component analysis. The correlation coefficient must be zero if the R-matrix is the identity matrix. The value of Bartlett's test should be below (0.5). This study is significant as the value of Bartlett's test is (.000). This value means that the R-matrix is not the identity matrix. As a consequence, this data was extremely significant ( $p < 0.001$ ) and the principal component analysis was appropriate. The value of initial communalities and extraction were measured as shown in table 11 below.

| Communalities   |         |            |
|---|---------|------------|
|   | Initial | Extraction |
| Supports faculty in meeting their teaching objectives.  | 1.000   | .618       |
| Enhances faculty interaction with students.   | 1.000   | .688       |
| Cannot facilitate faculty collaboration with other faculty.                                     | 1.000   | .608       |
| Develops faculty communication skills (e.g., writing feedback and presentation skills).         | 1.000   | .639       |
| Allows faculty to be a learning facilitator instead of an information provider.                 | 1.000   | .693       |
| Limits the faculty's choice of instructional materials (e.g., E-textbooks).                     | 1.000   | .638       |
| Provides the faculty with easy and quick access to instructional materials (e.g., E-textbooks). | 1.000   | .604       |

|   |       |      |
|---|-------|------|
| Eases the pressure of preparing teaching materials on the faculty (e.g., Reusable learning content).      | 1.000 | .543 |
| Cannot accommodate faculty's teaching styles.   | 1.000 | .584 |
| Motivates faculty to create more engaging student-centered learning activities.                           | 1.000 | .661 |
| Enhances the amount of Wi-Fi connection stress.   | 1.000 | .619 |
| Makes classroom management more difficult.  | 1.000 | .592 |
| Digital learning content (e.g., E-textbooks, tutorials, practices, lesson-plans, slides, course-outline). | 1.000 | .639 |
| Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom).                   | 1.000 | .603 |
| Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan).              | 1.000 | .646 |
| Analytical tools (e.g., Grade book, student retention center)   | 1.000 | .646 |
| Recreational tools (e.g., games)  | 1.000 | .606 |
| Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).                                    | 1.000 | .554 |
| Interactive- Audio visual (e.g., YouTube videos, voice recording tools, filming tools)                    | 1.000 | .655 |
| Expressive tools (e.g., word processing, on-line journal)   | 1.000 | .655 |

|  |       |      |
|--|-------|------|
| Evaluation tools (e.g., assignments, e-portfolio, testing)   | 1.000 | .626 |
| Informative tools (e.g., Web-links)  | 1.000 | .578 |
| Internet connection issues hinder the use of Blackboard Learn (Wi-Fi).   | 1.000 | .652 |
| Availability of Blackboard Learn support staff.  | 1.000 | .429 |
| Using Blackboard Learn more would create a disconnect between the students and the faculty (Less social interaction) | 1.000 | .571 |
| Using Blackboard Learn takes up too much time.   | 1.000 | .498 |
| Blackboard Learn can help faculty develop and adopt new teaching techniques and methodologies.                       | 1.000 | .634 |
| Blackboard Learn intimidates and threatens faculty.  | 1.000 | .656 |
| Using Blackboard Learn allows the faculty to act more as a guide pointing the students in the right direction.       | 1.000 | .551 |

Extraction Method: Principal Component Analysis.

[Table 11: Communalities values]

As shown above in table 11, the communalities indicated the variance accounted for items. Communalities represented the percentage of the variance of extracted components which ideally should be close to one. The initial values should be (1.000). In this study, communalities showed decent values. The highest and closest value to one was (.693) for the following variable (item 5) ‘Allows faculty to be a learning facilitator instead of an information provider’. Whereas, the lowest



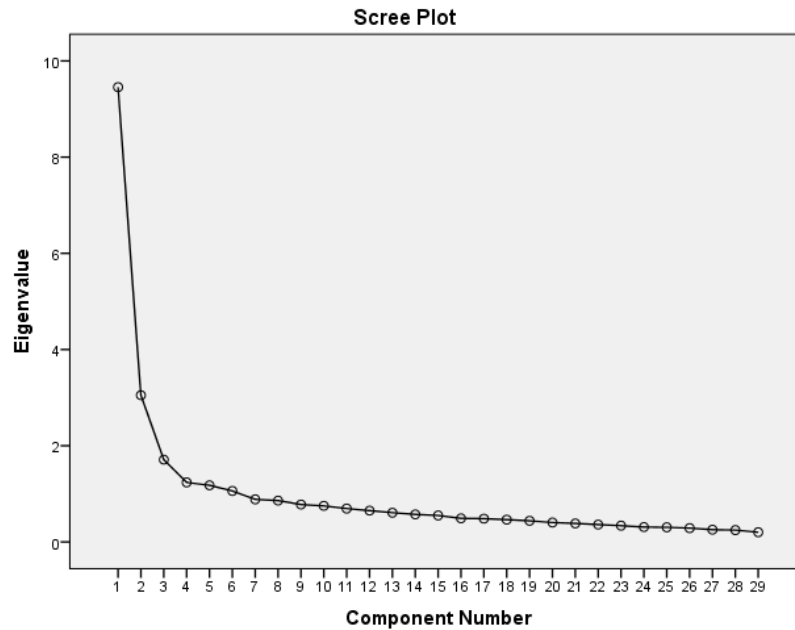
value was (.429) for this variable ‘Availability of blackboard support staff’. The factor loadings are the extractions as shown above in Table 11 and each variable value should be 4 and above. Any value of 4 and above means that this variable did load up with the new 6 factors mentioned below in table 12. The highest extraction value was (.693) for this variable ‘learning facilitator instead of an information provider’, whereas the lowest extraction value was (.429) for this variable ‘Availability of Blackboard Learn support staff’. All the 29 questions did load up to the new 6 factors and the total variance was explained and the new six factors grouped in table 12 below.

| Total Variance Explained |                     |               |              |                                     |               |              |                                   |               |              |
|--------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component                | Initial Eigenvalues |               |              | Extraction Sums of Squared Loadings |               |              | Rotation Sums of Squared Loadings |               |              |
|                          | Total               | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % | Total                             | % of Variance | Cumulative % |
| 1                        | 9.455               | 32.603        | 32.603       | 9.455                               | 32.603        | 32.603       | 5.462                             | 18.833        | 18.833       |
| 2                        | 3.050               | 10.517        | 43.120       | 3.050                               | 10.517        | 43.120       | 4.452                             | 15.350        | 34.183       |
| 3                        | 1.710               | 5.898         | 49.018       | 1.710                               | 5.898         | 49.018       | 2.395                             | 8.257         | 42.440       |
| 4                        | 1.237               | 4.265         | 53.284       | 1.237                               | 4.265         | 53.284       | 1.989                             | 6.859         | 49.299       |
| 5                        | 1.177               | 4.059         | 57.342       | 1.177                               | 4.059         | 57.342       | 1.723                             | 5.942         | 55.241       |
| 6                        | 1.059               | 3.653         | 60.995       | 1.059                               | 3.653         | 60.995       | 1.669                             | 5.754         | 60.995       |
| 7                        | .885                | 3.053         | 64.048       |                                     |               |              |                                   |               |              |
| 8                        | .859                | 2.962         | 67.009       |                                     |               |              |                                   |               |              |
| 9                        | .778                | 2.683         | 69.692       |                                     |               |              |                                   |               |              |
| 10                       | .749                | 2.583         | 72.275       |                                     |               |              |                                   |               |              |
| 11                       | .694                | 2.392         | 74.668       |                                     |               |              |                                   |               |              |
| 12                       | .651                | 2.244         | 76.911       |                                     |               |              |                                   |               |              |
| 13                       | .608                | 2.096         | 79.007       |                                     |               |              |                                   |               |              |
| 14                       | .573                | 1.975         | 80.983       |                                     |               |              |                                   |               |              |
| 15                       | .551                | 1.898         | 82.881       |                                     |               |              |                                   |               |              |

[Table 12: Total variance explained]

As shown above in Table 12; the total variance in the calculation of variances and the sum of all principal components. With 29 input variables, PCA initially extracted 6 factors or components. The first six values were greater than one and these were the new components out of the 29 components. That means only the first 6 components should be retained. Each quality score for each component is known as an eigenvalue. So, the quality score or the eigenvalue for the first factor was (9.455). The second item's eigenvalue was (3.050). The third item's eigenvalue was (1.710). The fourth item's eigenvalue was (1.237). The fifth item's eigenvalue was (1.177). The sixth item's eigenvalue was (1.059). The components that had high eigenvalues were representing the actual fundamental factor. As a result, the 29 variables seemed to measure 6 strong and

fundamental components because the eigenvalue value was at least 1. As a result, the scree plot shown below was allied to the total explained variance. See figure 14 below.



**[Figure 14: Scree plot]**

In the above figure, the scree plot showed a big drop from component one to component six. Then, all the way from component 6 to component 29 the rate of change was minimal across the values. The scree plot above confirmed that there were 6 new and strong factors and the rest components were weak factors and their values were below 1. There was not much change anymore right after the sixth component. Below the correlation between variables was tested in Table 13 below.

| Correlations  |                     |  |   |   |   |   |  |   |  |
|---|---------------------|--|---|---|---|---|--|---|--|
|   |                     | Supports faculty in meeting their teaching objectives. | Cannot facilitate faculty collaboration with other faculty. | Enhances faculty interaction with students. | Develops faculty communication skills (e.g., writing feedback and presentation skills). | Allows faculty to be a learning facilitator instead of an information provider. | Limits the faculty's choice of instructional materials (e.g., E-text books). | Provides the faculty with an easy and quick access to instructional materials (e.g., E-text books). | Eases the pressure of preparing teaching materials on the faculty (e.g., Reusable learning content). |
| Supports faculty in meeting their teaching objectives.                                  | Pearson Correlation | 1  | -.301**   | .611**                                      | .535**  | .554**  | -.247**  | .551**  | .297**   |
|   | Sig. (2-tailed)     |  | .000  | .000  | .000  | .000  | .000   | .000  | .000   |
|   | N                   | 329  | 329   | 329   | 329   | 329   | 329  | 329   | 329  |
| Cannot facilitate faculty collaboration with other faculty.                             | Pearson Correlation | -.301**  | 1   | -.233**                                     | -.185**   | -.214**   | .450**   | -.262**   | -.141**  |
|   | Sig. (2-tailed)     | .000   |   | .000  | .001  | .000  | .000   | .000  | .011   |
|   | N                   | 329  | 329   | 329   | 329   | 329   | 329  | 329   | 329  |
| Enhances faculty interaction with students.   | Pearson Correlation | .611**   | -.233**   | 1   | .591**  | .560**  | -.145**  | .516**  | .396**   |
|   | Sig. (2-tailed)     | .000   | .000  |   | .000  | .000  | .008   | .000  | .000   |
|   | N                   | 329  | 329   | 329   | 329   | 329   | 329  | 329   | 329  |
| Develops faculty communication skills (e.g., writing feedback and presentation skills). | Pearson Correlation | .535**   | -.185**   | .591**                                      | 1   | .571**  | -.153**  | .517**  | .281**   |
|   | Sig. (2-tailed)     | .000   | .001  | .000  |   | .000  | .006   | .000  | .000   |
|   | N                   | 329  | 329   | 329   | 329   | 329   | 329  | 329   | 329  |
| Allows faculty to be a learning facilitator instead of an information provider.         | Pearson Correlation | .554**   | -.214**   | .560**                                      | .571**  | 1   | -.213**  | .414**  | .250**   |
|   | Sig. (2-tailed)     | .000   | .000  | .000  | .000  |   | .000   | .000  | .000   |
|   | N                   | 329  | 329   | 329   | 329   | 329   | 329  | 329   | 329  |
| Limits the faculty's choice of instructional materials (e.g., E-text books).            | Pearson Correlation | -.247**  | .450**  | -.145**                                     | -.153**   | -.213**   | 1  | -.261**   | -.080  |
|   | Sig. (2-tailed)     | .000   | .000  | .008  | .006  | .000  |  | .000  | .149   |
|   | N                   | 329  | 329   | 329   | 329   | 329   | 329  | 329   | 329  |

[Table 13: The correlation between variables]

The correlation was tested between variables in the study. The ideal value of correlation should be (8) or above to assure the multicollinearity test. As shown above, the correlation value between (item 1) 'Supports faculty in meeting their teaching objectives and (item 3) 'Enhances faculty interaction with students' was (.611) which was below the required value. Some negative correlation values were found because some variables were negative. The correlation value found between (item 6) 'Limits the faculty's choice of instructional materials and (item 8) 'Eases the pressure of preparing teaching materials on the faculty and the value was (.080) which approved that there was no multicollinearity between variables. In order to double-check and confirm the multicollinearity, a regression test must be conducted. Three random variables were selected for the regression test. For example, the dependent item was (item 1) 'Supports faculty in meeting their teaching objectives. Another two items were selected as independent variables and they were (item 4) 'Develops faculty's communication skills' and (item 12) 'Makes classroom management more difficult'. A very key component was considered as well. It was the variance inflation factor (VIF). As shown below in table 14 the coefficients and VIF values.

| Coefficients <sup>a</sup> |   |                         |       |
|---------------------------|---|-------------------------|-------|
| Model                     |   | Collinearity Statistics |       |
|                           |   | Tolerance               | VIF   |
| 1                         | Develops faculty communication skills (e.g., writing feedback and presentation skills). | .938                    | 1.066 |
|                           | Makes classroom management more difficult.  | .938                    | 1.066 |

a. Dependent Variable: Supports faculty in meeting their teaching objectives.

[Table 14: 1<sup>st</sup> coefficients and VIF values]

The table above shows the value of VIF. In this scenario, the VIF value was less than 3. The exact value of VIF was (1.066). This value guaranteed that there was no multicollinearity among variables. Another check was done to confirm the results. The dependant in the second example was (item 4) ‘Develops faculty communication skills’ and the two independents were (item 1) ‘Supports faculty in meeting their teaching objectives’ and (item 12) ‘Makes classroom management more difficult. The results were shown below in table 15.

| Coefficients <sup>a</sup> |  |                         |       |
|---------------------------|--|-------------------------|-------|
| Model                     |  | Collinearity Statistics |       |
|                           |  | Tolerance               | VIF   |
| 1                         | Makes classroom management more difficult.             | .883                    | 1.132 |
|                           | Supports faculty in meeting their teaching objectives. | .883                    | 1.132 |

a. Dependent Variable: Develops faculty communication skills (e.g., writing feedback and presentation skills).

[Table 15: 2<sup>nd</sup> coefficients and VIF values]

As shown above table 15, the value of VIF was less than (.3), it was (1.132) for both selected items. There was no multicollinearity between the variables. Another test was done by switch the dependent to another item which was (item 12) ‘Makes classroom management more difficult’ and

the independents were (item 4) 'Develops faculty communication skills' and (item 1) 'Supports faculty in meeting their teaching objectives. The results are shown below in table 16.

| Coefficients <sup>a</sup> |   |                         |       |
|---------------------------|---|-------------------------|-------|
| Model                     |   | Collinearity Statistics |       |
|                           |   | Tolerance               | VIF   |
| 1                         | Supports faculty in meeting their teaching objectives.                                  | .714                    | 1.400 |
|                           | Develops faculty communication skills (e.g., writing feedback and presentation skills). | .714                    | 1.400 |

a. Dependent Variable: Makes classroom management more difficult.

[Table 16: 3<sup>rd</sup> the coefficients and VIF values]

Again the VIF value for both items was below (.3) as shown in the table above. The VIF value was 1.400 which assured that there was no multicollinearity between variables. Finally, these above tests and values confirmed the validity of this study and approved that this study is effective to be considered. The component matrix was discussed in table 17 below.

| Component Matrix <sup>a</sup>   |           |       |      |       |       |       |
|---|-----------|-------|------|-------|-------|-------|
|   | Component |       |      |       |       |       |
|   | 1         | 2     | 3    | 4     | 5     | 6     |
| Supports faculty in meeting their teaching objectives.                                  | .715      | -.003 | .219 | -.077 | .090  | .212  |
| Cannot facilitate faculty collaboration with other faculty.                             | -.402     | .398  | .112 | .507  | .086  | .103  |
| Enhances faculty interaction with students.   | .693      | -.064 | .375 | .057  | .086  | .229  |
| Develops faculty communication skills (e.g., writing feedback and presentation skills). | .682      | .030  | .387 | .139  | -.056 | -.027 |

|  |       |       |       |       |       |       |
|--|-------|-------|-------|-------|-------|-------|
| Allows faculty to be a learning facilitator instead of an information provider.                            | .679  | .035  | .399  | .030  | -.265 | .015  |
| Limits the faculty's choice of instructional materials (e.g., E-text books).                               | -.356 | .388  | .075  | .536  | .055  | .254  |
| Provides the faculty with easy and quick access to instructional materials (e.g., E-text books).           | .700  | .008  | .205  | -.097 | .251  | -.020 |
| Eases the pressure of preparing teaching materials on the faculty (e.g., Reusable learning content).       | .394  | -.081 | .282  | .092  | .519  | .153  |
| Cannot accommodate faculty's personal teaching styles.   | -.391 | .556  | -.060 | .298  | -.110 | .130  |
| Motivates faculty to create more engaging student-centered learning activities.                            | .706  | .115  | .348  | -.049 | -.151 | .051  |
| Enhances the amount of Wi-Fi connection stress.  | -.050 | .572  | -.128 | -.317 | -.204 | .363  |
| Makes classroom management more difficult.   | -.454 | .601  | -.007 | .039  | -.123 | .090  |
| Digital learning content (e.g., E-text books, tutorials, practices, lesson-plans, slides, course-outline). | .704  | .058  | -.290 | -.058 | .098  | .208  |
| Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom).                    | .693  | .200  | -.287 | -.018 | .000  | .030  |
| Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan).               | .702  | .253  | -.222 | .072  | .050  | -.175 |
| Analytical tools (e.g., Grade book, student retention center)  | .667  | .079  | -.369 | .122  | .210  | .017  |

|  |       |      |       |       |       |       |
|--|-------|------|-------|-------|-------|-------|
| Recreational tools (e.g., games)   | .515  | .382 | .013  | .039  | -.268 | -.348 |
| Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).   | .642  | .149 | -.306 | .161  | .010  | .032  |
| Interactive- Audio visual (e.g., YouTube videos, voice recording tools, filming tools)                               | .688  | .218 | -.271 | .029  | .012  | -.246 |
| Expressive tools (e.g., word processing, on-line journal)  | .676  | .278 | -.154 | .026  | -.137 | -.279 |
| Informative tools (e.g., Web-links)  | .710  | .190 | -.185 | .063  | .013  | -.009 |
| Evaluation tools (e.g., assignments, e-portfolio, testing)   | .650  | .069 | -.243 | .093  | .319  | .170  |
| Internet connection issues hinder the use of Blackboard Learn (Wi-Fi).   | -.070 | .527 | -.060 | -.487 | -.045 | .355  |
| Availability of Blackboard Learn support staff.  | .202  | .365 | .182  | -.334 | .320  | -.093 |
| Using Blackboard Learn more would create a disconnect between the students and the faculty (Less social interaction) | -.416 | .595 | .116  | -.044 | .102  | -.135 |
| Using Blackboard Learn takes up too much time.   | -.403 | .491 | .134  | -.167 | .129  | -.176 |
| Blackboard Learn can help faculty develop and adopt new teaching techniques and methodologies.                       | .661  | .075 | .225  | .055  | -.329 | .170  |
| Blackboard Learn intimidates and threatens faculty.  | -.247 | .505 | .341  | -.035 | .327  | -.339 |
| Using Blackboard Learn allows the faculty to act more as a guide pointing the students in the right direction.       | .646  | .045 | .246  | .059  | -.240 | -.102 |

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

**[Table 17: Component factors]**

Table 17 above shows the components matrix. The components matrix is the Pearson correlations between the components (factors) and the items (variables) and these correlations are known as factor loadings. As confirmed at the bottom of the table, 6 components were extracted. In an ideal world, each item or variable input should measure only one factor. But, in this study, this is not the situation. For example, the following variable (item 4) ‘Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom)’ measured and correlated with components 1, 2, and 6. In addition to that, it showed negative values with components 3 and 4. It didn’t measure or correlate with component 5 as its value was (.000). If a variable had more than one factor component, that called cross-loading and it makes the interruption of the data very challenging. This demanding situation can be fixed by the rotation and rotating of the components. The varimax rotation will be used. As shown in the table 18 below the rotated component matrix .

| Rotated Component Matrix <sup>a</sup>   |           |       |       |       |      |       |
|---|-----------|-------|-------|-------|------|-------|
|   | Component |       |       |       |      |       |
|   | 1         | 2     | 3     | 4     | 5    | 6     |
| Supports faculty in meeting their teaching objectives.                                  | .324      | .545  | -.195 | -.093 | .403 | .088  |
| Cannot facilitate faculty collaboration with other faculty.                             | -.143     | -.119 | .737  | .167  | .001 | -.044 |
| Enhances faculty interaction with students.   | .212      | .642  | -.106 | -.117 | .453 | -.029 |
| Develops faculty communication skills (e.g., writing feedback and presentation skills). | .266      | .706  | -.059 | .011  | .207 | -.155 |
| Allows faculty to be a learning facilitator instead of an information provider.         | .207      | .792  | -.120 | -.057 | .060 | -.025 |



|  |       |       |       |       |       |       |
|--|-------|-------|-------|-------|-------|-------|
| Limits the faculty's choice of instructional materials (e.g., E-text books).                               | -.118 | -.094 | .781  | .038  | .053  | .031  |
| Provides the faculty with easy and quick access to instructional materials (e.g., E-text books).           | .384  | .449  | -.268 | .109  | .410  | -.059 |
| Eases the pressure of preparing teaching materials on the faculty (e.g., Reusable learning content).       | .133  | .218  | -.039 | .083  | .666  | -.159 |
| Cannot accommodate faculty's personal teaching styles.   | -.042 | -.144 | .662  | .161  | -.209 | .233  |
| Motivates faculty to create more engaging student-centered learning activities.                            | .280  | .732  | -.142 | .012  | .148  | .066  |
| Enhances the amount of Wi-Fi connection stress.  | .094  | .022  | .172  | .091  | -.121 | .747  |
| Makes classroom management more difficult.   | -.135 | -.157 | .500  | .299  | -.252 | .382  |
| Digital learning content (e.g., E-text books, tutorials, practices, lesson-plans, slides, course-outline). | .643  | .202  | -.177 | -.230 | .267  | .171  |
| Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom).                    | .703  | .247  | -.116 | -.093 | .085  | .134  |
| Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan).               | .745  | .278  | -.078 | .070  | .040  | -.031 |
| Analytical tools (e.g., Grade book, student retention center)  | .745  | .088  | -.080 | -.136 | .237  | -.045 |
| Recreational tools (e.g., games)   | .502  | .456  | -.008 | .235  | -.301 | -.009 |

|  |       |       |       |       |       |       |
|--|-------|-------|-------|-------|-------|-------|
| Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).   | .690  | .208  | .005  | -.166 | .086  | .008  |
| Interactive- Audio visual (e.g., YouTube videos, voice recording tools, filming tools)                               | .753  | .242  | -.146 | .071  | -.036 | -.051 |
| Expressive tools (e.g., word processing, on-line journal)  | .681  | .379  | -.113 | .110  | -.152 | -.024 |
| Informative tools (e.g., Web-links)  | .672  | .324  | -.071 | -.060 | .108  | .042  |
| Evaluation tools (e.g., assignments, e-portfolio, testing)   | .639  | .120  | -.056 | -.134 | .425  | .021  |
| Internet connection issues hinder the use of Blackboard Learn (Wi-Fi).   | .022  | -.028 | .025  | .201  | .016  | .781  |
| Availability of Blackboard Learn support staff.  | .160  | .121  | -.141 | .505  | .247  | .231  |
| Using Blackboard Learn more would create a disconnect between the students and the faculty (Less social interaction) | -.127 | -.163 | .363  | .567  | -.141 | .234  |
| Using Blackboard Learn takes up too much time.   | -.171 | -.176 | .203  | .577  | -.119 | .221  |
| Blackboard Learn can help faculty develop and adopt new teaching techniques and methodologies.                       | .280  | .706  | -.041 | -.209 | .030  | .108  |
| Blackboard Learn intimidates and threatens faculty.  | -.108 | -.022 | .226  | .768  | .052  | -.017 |
| Using Blackboard Learn allows the faculty to act more as a guide pointing the students in the right direction.       | .307  | .657  | -.125 | -.031 | -.023 | -.090 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

- a. Rotation converged in 7 iterations.

[Table 18: Rotated Component Matrix]

As shown in the table above, the rotated component matrix presented which variable measured which component. For instance, the third component was measured by the second variable which was ‘Cannot facilitate faculty collaboration with other faculty’ and its value was (.737). The second component was measured by this variable ‘communication skills (e.g., writing feedback and presentation skills’ and the value of correlation was (.737). Rotation means reorganizing the factor loadings over the factors to make it less complicated. High values represented the factor loadings and low values represented the cross-loadings. For example, the second section of the survey (items from 13-23) supposed to measure the process of BBL integration by faculty members. As shown below in table 19.

| Pattern Matrix <sup>a</sup>  |           |       |
|--|-----------|-------|
|  | Component |       |
|  | 1         | 2     |
| Supports faculty in meeting their teaching objectives.   | .774      |       |
| Digital learning content (e.g., E-text books, tutorials, practices, lesson-plans, slides, course-outline). | .845      |       |
| Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom).                    | .546      |       |
| Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan).               | .349      | .531  |
| Analytical tools (e.g., Grade book, student retention center)  | .681      |       |
| Recreational tools (e.g., games)   | -.320     | 1.023 |

|  |      |      |
|--|------|------|
| Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).<br>Interactive- Audio visual (e.g., YouTube videos, voice recording tools, filming tools) | .587 | .572 |
| Expressive tools (e.g., word processing, on-line journal)  |      | .789 |
| Evaluation tools (e.g., assignments, e-portfolio, testing)   | .926 |      |
| Informative tools (e.g., Web-links)  | .586 |      |

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

**[Table 19: Pattern Matrix]**

As shown above, table 19 gives a summary of the items that measure highly on a construct. There were no items loading nowhere, every item was loading somewhere. There was a negative loading as well in (item 18) 'Recreational tools (e.g., games)'. The lower loading was (item 14) 'Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan) and its value was (.349) excluding the negative loading value which was (.320). All of the rest items were fairly high expect the negative loading value of (item 18) which should be dropped. The strongest cross-loading factor value was (1.023) for this variable 'Recreational tools (e.g., games)'. The second strongest value was (.926) for this variable 'Evaluation tools (e.g., assignments, e-portfolio, testing)'. The next strongest cross-loading was (item 14) 'Digital learning content (e.g., E-text books, tutorials, practices, lesson-plans, slides, course outline and the score was (.845) and that needs to be dropped. The above table pointed out that there was an oblique rotation. See table 20 below.

| Component Correlation Matrix |       |       |
|------------------------------|-------|-------|
| Component                    | 1     | 2     |
| 1                            | 1.000 | .644  |
| 2                            | .644  | 1.000 |

[Table 20: Component Correlation Matrix]

The above table shows the component correlation matrix and it indicated that the components were highly correlated. As shown below in table 21 the output of the descriptive statistics will be highlighted.

| Descriptive Statistics  |     |         |         |      |                |
|---|-----|---------|---------|------|----------------|
|   | N   | Minimum | Maximum | Mean | Std. Deviation |
| Supports faculty in meeting their teaching objectives.  | 329 | 1       | 5       | 4.15 | .830           |
| Cannot facilitate faculty collaboration with other faculty.   | 329 | 1       | 5       | 2.69 | 1.108          |
| Enhances faculty interaction with students.   | 329 | 1       | 5       | 3.76 | .979           |
| Develops faculty communication skills (e.g., writing feedback and presentation skills).             | 329 | 1       | 5       | 3.66 | .982           |
| Allows faculty to be a learning facilitator instead of an information provider.                     | 329 | 1       | 5       | 3.81 | .944           |
| Limits the faculty's choice of instructional materials (e.g., E-text books).                        | 329 | 1       | 5       | 3.07 | 1.148          |
| Provides the faculty with an easy and quick access to instructional materials (e.g., E-text books). | 329 | 1       | 5       | 3.75 | 1.002          |

|  |     |   |   |      |       |
|--|-----|---|---|------|-------|
| Eases the pressure of preparing teaching materials on the faculty (e.g., Reusable learning content).       | 329 | 1 | 5 | 3.37 | 1.138 |
| Cannot accommodate faculty's personal teaching styles.   | 329 | 1 | 5 | 3.04 | 1.152 |
| Motivates faculty to create more engaging student-centred learning activities.                             | 329 | 1 | 5 | 3.63 | .980  |
| Enhances the amount of Wi-Fi connection stress.  | 329 | 1 | 5 | 3.56 | 1.052 |
| Makes classroom management more difficult.   | 329 | 1 | 5 | 2.92 | 1.207 |
| Digital learning content (e.g., E-text books, tutorials, practices, lesson-plans, slides, course-outline). | 329 | 1 | 5 | 3.96 | .874  |
| Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom).                    | 329 | 1 | 5 | 3.81 | .940  |
| Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan).               | 329 | 1 | 5 | 3.71 | .956  |
| Analytical tools (e.g., Grade book, student retention center)  | 329 | 1 | 5 | 3.85 | .938  |
| Recreational tools (e.g., games)   | 329 | 1 | 5 | 2.93 | 1.223 |
| Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).                                     | 329 | 1 | 5 | 3.79 | .961  |
| Interactive- Audio visual (e.g., YouTube videos, voice recording tools, filming tools)                     | 329 | 1 | 5 | 3.69 | .934  |
| Expressive tools (e.g., word processing, on-line journal)  | 329 | 1 | 5 | 3.37 | .983  |

|  |     |   |   |      |       |
|--|-----|---|---|------|-------|
| Evaluation tools (e.g., assignments, e-portfolio, testing)   | 329 | 1 | 5 | 3.93 | .831  |
| Informative tools (e.g., Web-links)  | 329 | 1 | 5 | 3.79 | .859  |
| Internet connection issues hinder the use of Blackboard Learn (Wi-Fi).   | 329 | 1 | 5 | 3.44 | 1.147 |
| Availability of Blackboard Learn support staff.  | 329 | 1 | 5 | 3.35 | 1.117 |
| Using Blackboard Learn more would create a disconnect between the students and the faculty (Less social interaction) | 329 | 1 | 5 | 3.29 | 1.204 |
| Using Blackboard Learn takes up too much time.   | 329 | 1 | 5 | 2.87 | 1.125 |
| Blackboard Learn can help faculty develop and adopt new teaching techniques and methodologies.                       | 329 | 1 | 5 | 3.84 | .919  |
| Blackboard Learn intimidates and threatens faculty.  | 329 | 1 | 5 | 2.53 | 1.110 |
| Using Blackboard Learn allows the faculty to act more as a guide pointing the students in the right direction.       | 329 | 1 | 5 | 3.52 | .953  |
| Valid N (listwise)   | 329 |   |   |      |       |

[Table 21, Descriptive Statistics]

As shown above in table 21, the output of the descriptive analysis will be highlighted as the following;

- No faculty were missing any question items. The percentage of response was 100%. As the participants number was N=329.

- The maximum scores observed on the items was 5 and this is the maximum possible score. That means there were no issues with the scoring or the measurement. No problems with data entry was witnessed.
- The highest average score was for (item 1) which is ‘Supports faculty in meeting their teaching objectives’ at a score of (4.15). But, the lowest standard deviation in score at (.830).
- The mean score for (item 28) which is ‘Blackboard Learn intimidates and threatens faculty’ was far less than the other items’ mean and the score was (2.53).
- The averages of items 3, 6 and 14 scores were really close at (3.71 to 3.75).
- Item 12 which is ‘Makes classroom management more difficult’ had a low average score at (2.93) but, the highest standard deviation in score at (1.223).

#### **3.4.5.1 Expert Review of Instruments**

The survey instrument was adopted and developed to gather the faculty member’s responses and it was validated by a team of four experts in the educational field and higher education research field. The team of experts included an experienced faculty member, the program chair of the educational division, the doctoral study supervisor, and the research committee head. The panel of experts confirmed the validity of the instrument and its content. Two to three questions in each section of the survey were rephrased to make them clearer for the respondents. A pilot study was completed with a small scale of participants to assure the quality of the instrument. The questionnaire was inspired by the survey; the questions were reworded to open-ended questions.

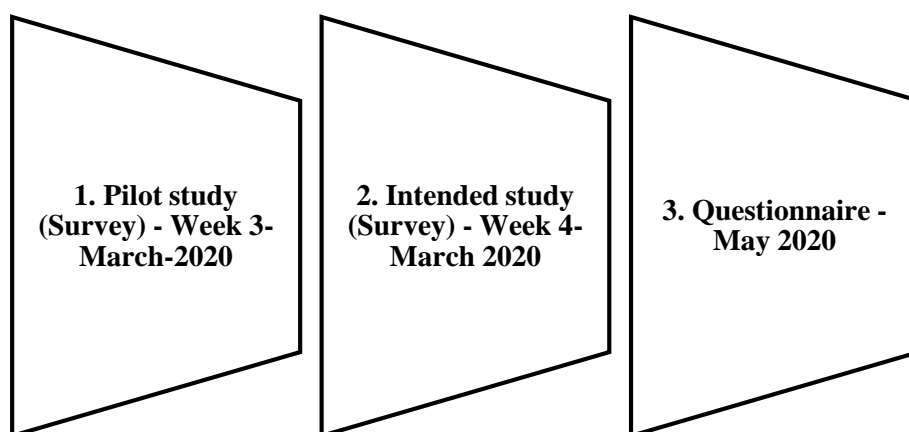
#### **3.4.5.2 Pilot Study**

A pilot study is like a traffic sign that assists the researcher to stop researching if the data tool is not good enough, or adjust some questions based on participant's feedback. Then the data tool can give the researcher the green light to start the intended study when no issues appear. A pilot study is a research study that should be tested before the planned or proposed study. The difference between the intended study and the pilot study is that the pilot study is usually implemented on a



small scale, whereas the intended study is executed on a larger scale. Even though, the pilot study does not remove the data tool errors or predict the issues that may appear in the intended study, it helps to decrease some issues such as, the mistakes in the text, repeating the same idea into two questions, having two main ideas in the one question or having unclear questions. The pilot study decreases the risk of having unexpected glitches. Conducting the intended study without conducting a pilot study first is considered to be a waste of time, effort, and energy (Payne 2020).

Therefore, a pilot study has been implemented in the first week of March 2020 to test the data tool efficiency and develop it if required. In addition to that, the pilot study was done to check the usability of the data tool as well as its reliability. A total of five (5) surveys have been shared with research experts to do the pilot study, three (3) out of the total number were completed. The response rate in the pilot study is 1.6%. The pilot study took place in ADW, one of these institution campuses in Abu Dhabi. The researcher requested volunteers to do the pilot study for more clarity of the research data tool and the three participants were interested to do the pilot study. Meaningful feedback was given for the researcher to rewrite question number five in the survey and delete question number seven from the survey as somehow it was similar to one of the questions. The structure of the survey was changed as well to make it easy for the eyes. All changes suggested by the participants were taken into consideration. Then, the intended study was done followed by the questionnaire as shown in Table 22.



[Table 22: the process of the pilot study and the intended study]

As shown in Table 22, the first pilot study took place at one campus which is the ADW campus of this institution with a small scale of participants. After a week, the tool was revised and developed with the supervision of experts and the researcher as well. The second step was conducting the intended study with a large scale of participants. The study went well with no technical issues or question errors in the last week of March 2020. After the data analysis of the survey, the researcher acquired more data by conducting a questionnaire in May 2020.

### **3.5 Data Analysis Plan**

The main three elements in the topic of the research are the following technology integration, BBL, and faculty perspectives. Thus, the institution included in this study was the very first higher education organization in the UAE that valued the implementation of technology and it has enormous years of dealing with technology and BBL, and it's one of the tops and certified higher education institutions in the UAE. Since, the first option is this higher education organization, the authorized committee of research in this institution was approached immediately in October 2019. The authorized person was researched in person, via emails, and phone calls as well. The official approval to conduct the study was issued in January 2020 and it took about five (5) months of back and forth emails and editing some questions before the official approval. The approval can be found in appendix D. The campus of this institution was called 'ADW' which is Abu Dhabi Women's campus.

#### **3.5.1 Quantitative Data Analysis**

The quantitative data gathered from the survey was analyzed using the Statistical Package for the Social Sciences (SPSS) version 25 and this is the latest version of SPSS. Two types of analysis were conducted to confirm the final results of this study. It is very significant to check the validity and the reliability of the input to make sure that the study is on the right track. Thus, principal component analysis (PCA) and reliability analysis were tested to determine the validity and reliability of the research results. As mentioned by Johnson and Christensen (2014), reliability is the repeatability and consistency of the research results. Whereas, validity is the interference truthfulness completed of the research results.

After that, the next test is the reliability analysis that was done for the survey questions on different scales to assure that the survey is reliable. The correlation between the variables has was analyzed. In addition to that, statistical data described the details of the survey scales as presented to answer the research questions. The mean, range, and standard deviation were analyzed in addition to the delivery of response regularities for each scale.

### **3.5.2 Qualitative Data Analysis**

The questionnaire was used in the qualitative design as mentioned above. The questionnaire was designed to be an online questionnaire. The researcher emailed the participants the questionnaire as a link through an email. The main purpose of this tool is to get detailed feedback from the participants. Thus, this note was mentioned before they start answering the questionnaire, which is 'Please write a detailed answer'. Written data was divided into themes known as text segments. Then, the researcher reflected on the text segment of the participants. Afterwards, the data were interpreted to come up with recommendations for the faculty to integrate technology and BBL in the best possible ways and get the full advantage of technology and BBL.

The analysis of the qualitative data started with preparing a grid to organize the data given in the questionnaire. Then a simple coding system was done by giving each question a code. For example, the first question was given the code 'Q1', the second question was coded as 'Q2' until question number 17. Then the data given from the respondents were added to the grid. The common points, the trends, the challenges, and the best practices were highlighted.

### **3.6 Delimitations of the Study**

In this present study, several delimitations were witnessed. First of all, this study focused on the higher education level and did not include the school level because many previous studies of technology integration covered similar situations from the point of view of schools. In addition, the BBL is only used at the higher education level in the UAE either during the COVID-19 pandemic or before it. However, this tool was the key remote education tool during the quarantine.

Secondly, one higher education institution was selected for this study. This public institution has 14 campuses around the UAE. This study targets one country which is the United Arab Emirates (UAE), as it has a good remote education system during the quarantine of either the private or public sectors and the country sets clear directives for the Vision of 2021 in regard to utilizing technology and have a smart education system. The National Agenda emphasizes the development of education services provided for the students as well as supporting the education with the latest technologies. In the future, it would be interesting to include other countries of the GCC countries to compare their practices using technology in higher education, using BBL and the status of remote education during the pandemic.

Thirdly and finally, the present study collected data from the faculty members' perspectives only because they are the key users of BBL during the COVID-19 pandemic. It would be interesting to include the students and the admin staff in this study to compare their input, find the trends, and the challenges. In addition, individual interviews will be considered in future studies as well.

### **3.7 Ethical Consideration**

A number of procedures were taken in this research to assure following ethical consideration. In this section a number of points will be discussed in regard to principles of ethical considerations, trustworthiness, reliability, the role of the researcher as the following below;

#### **3.7.1 Principles of Ethical Considerations**

One of the key aspects of any social research is ethical considerations. The terminology of ethics refers to questioning the researcher about the research producers he or she followed and find out if it is right or wrong actions. When the researcher is deleting some data that do not support the hypothesis he or she reported, then this will be considered a violation of the ethical practice. Ethical consideration can also be defined as the researcher's ultimate responsibility to keep the participants away from the type of harm. The researcher should ensure that the participants are protected from any type of harm, such as physical harm, psychological harm, anxiety, or risk that may appear due

to the research progression. Ethical considerations must be implemented during the whole process of the research in all stages, starting from gathering data, to analyzing data until recording the final results of the research (Fraenkel, Wallen and Hyun 2006).

The procedures were implemented to ensure that the ethical considerations related to maintaining the confidentiality of the identity of the participants were honoured to protect them from any harm and protect their privacy. Before starting the study, the participants were informed that their personal information will remain anonymous until the end of the study. The participant's confidentiality and anonymity were the priority in this research before, during, and after the study. The researcher also provided her contact email and contact number with the participant's in case they have any inquiries regarding this study.

This study is a low-risk study. The only possible risk and discomfort in this study is time. As faculty members will have to get time out of their breaks to answer the survey questions within the busy schedule involving back to back classes. In addition, this organization values and uses BBL daily which may affect the faculty members' views. Prior to the survey took place, they were informed that this has nothing to do with the annual appraisal or their evaluation or their promotion. At the same time, this current study was shared with the faculty members, two other different studies were shared with them which made the faculty stressing all these studies at the same time and made them ignoring some.

The first step that the researcher took to follow the protocol of the ethical considerations is obtaining the British University in Dubai (BUID) ethical clearance approval as this study is supervised by a professor from BUID and this study represented the university. Varied forms were filled to describe the study and its dimensions and the risk of the study. After addressing all the details of the study, approval was gained. In the ethical clearance, the institution name was mentioned and in this study, they requested the name of the institution to be anonymous. Thus, this ethical clearance has not been added to the appendix. Then, another approval was taken from the institution where the research conducted the study. Afterwards, an email was sent to the institution Dean Office to present the study and share the data tools.

To reduce the ethical issues in this present study, several principles were done as the following;

- **Participants should be Protected from Harm**

The total number of participants is 329 in the survey and 14 in the questionnaire. All participants were interested to be part of this study. The survey was completed online in a comfortable environment at their convenient time. Participants of the study were given enough time to complete the survey with no pressure at all. The participants were not put in any type of harmful situation such as physical harm, psychological harm, or risk.

- **Participant's Dignity**

Participants of the research were informed about the research topic, research questions, and research objectives. They were given detailed information about the research procedures as well to give them a clear idea of the research. In addition, the researchers asked the participants if they can be reached for further information. The ones who were available were contacted for obtaining further information about the topic through the use of a questionnaire. The ones who were unwilling to do so were not bothered or coerced in any way. Faculty time was valued and their dignity was fully respected. Participants were informed that their participation is not compulsory and they have the opportunity to withdraw from this study at any stage they want. Furthermore, participants were informed that if they completed the survey, that means they gave the researcher the approval to be part of this study and use their voice in the study.

- **Participant's Identity**

Participant's identities were not shared in this study. Only their years of experience, the campus they are working at, their level of technical proficiency, and their gender. The identities of the participant's remained anonymous to all including the researcher.

### **3.7.2 Role of the Researcher**

The researcher plays an important role in the study. Therefore, a brief description of the researcher will be added here. The researcher is female and an Emirati faculty member. She has five (5) years of experience as a lecturer in higher education and this her first job offered after her graduation of

the Bachelor's Degree. She has the British board of certified teachers around the world from the HEA Academy in the UK. She is a member of the Youth Council in the UAE. She completed her Bachelor of Education in 2012 and her Master's in Education 'management policy and leadership' in 2017. She is passionate about the youth leadership program and consistently attending these activities. In addition to that, she is passionate about technology in education. In 2017, she started her PhD in the same path of educational leadership. At the moment she is a faculty member at a public institution in the UAE, Abu Dhabi in the Education division.

The researcher role in this study is mainly assuring that all ethical considerations were followed as per the norms. No issues were witnessed with the participants. However, the researcher was available for any concerns about the research questions or research procedures. The participants' identify and input was well protected. Avoidance of bias and data trustworthiness was the researcher's key points in this stage and all stages of the research. Ethics were approved by BUID (See appendix A).

### **3.8 Trustworthiness, Site, Samples**

Trustworthiness in a quantitative study is different from the of a qualitative study. In the quantitative study, trustworthiness refers to the instrument's validity and reliability. Whereas, the trustworthiness of qualitative research refers to four key concepts and they are credibility, transferability, conformability, and dependability of the research's findings. In this research to assure that the study is credible, the researcher triangulated the results by using different data collection methods, comparing the results between the data tools and capturing the differences found between the data tools.

This study is transferable as well because the study findings can be applied to other contexts, environments, and status as most higher education institutions are using BBL and integrating technology during the normal study days and during the coronavirus. This study is confirmable because the findings of this study are based on participants' responses only. There is no negligible possibility of bias or personal enthusiasms of the researcher. This study can be repeated in any

context or circumstance and will still get consistent findings which means it is a dependable study (Kulkarni 2020).

Authenticity criteria of qualitative research measure the standards that shape the accuracy, reliability, validity, consistency and rigor of the research (Lincoln 2007). In this research, the researcher's values directed this study because it is a matter of professional socialization and researcher's integrity. In addition, the research is transparent as it reported the data collected of the research with transparency. Besides, the research was built based on participant's views based on the experiences that they shared. The researcher encouraged the participants to communicate and stick to the thoughts. This study is following the criteria of authenticity. First of all fairness, the study used a wide range of views to shape the study and enrich it with different points of view.

In scientific research, the researchers are tending to focus on reliability, objectivity, and validity and considering all these three points. As a result, those three points are assuring the trustworthiness of the research (Anney 2014). In this present mixed-methods study, validity was confirmed by the principal component analysis because this developed data tool is measuring what exactly needs to be measured and checking the suitability of using BBL during the COVID-19 pandemic in the UAE. Additionally, the reliability of the findings was confirmed by computing Cronbach's Alpha which measures the consistency between items in the scale and it was over 0.901, which was a very high score.

### **3.9 Summary**

This part of the research outlined the information provided in chapter three (3). This chapter covered the research approach, along with the research design, the data collection tools, the quantitative design and survey details, the qualitative design and questionnaire details, the population of the research, the sampling technique followed, the quantitative data analysis technique, the scope of the study, the ethical considerations, validity, reliability, the trustworthiness, and the authenticity of the research outcomes. The next chapter highlights the analysis of the data gathered for this current study.



## **CHAPTER FOUR: RESULTS, ANALYSIS AND DISCUSSION**

### **4.1 Overview of the Chapter**

This chapter reveals the findings of both the quantitative and qualitative data analysis. The quantitative data will be revealed first including the study validity, reliability, and correlational analysis with descriptive statistics. Additionally, the quantitative research questions will be answered in a section called the quantitative research summary. All findings are based on the input collected from the survey. Thereafter, the qualitative data will be presented including the faculty member's narrative data from the questionnaire with technology integration and the case of BBL during the COVID-19 pandemic. This is followed by a qualitative findings summary as the qualitative questions are answered based on the input of the questionnaire. In conclusion, a triangulation of both data tools will be conducted towards the end of this chapter.

### **4.2 Analysis of Quantitative Data**

This chapter presents the data analysis of a revised survey used in this study for the topic of TI and BBL in higher education in the UAE. The survey was created by Mundy, Kopczynski, and Kee back in 2012. Principal component analysis (PCA) has been done to test the validity of the results and it will be discussed later in this section. A Cronbach's alpha test was also conducted to confirm the reliability of the results and it is discussed in this section. Additionally, a Pearson product-moment correlation analysis was done to test the correlation between variables in this study. Lastly, the interpretation of the data collected to the three quantitative research questions have been presented as the following:

The primary research question is:

How technology integration in higher education is occurring in the UAE? And how do faculty members perceive the usability of BBL?

Specific research questions are:

**Research Question 1:** What are the trends and developments accounted for in the literature on technology integration in higher educational institutions in the UAE?

**Research Question 2:** How is BBL used to realize the technology integration in the higher educational institutions in the UAE?

**Research Question 3:** What are the experiences and perspectives of faculty members on the usability of BBL?

#### **4.2.1 Data Screening**

One institution in the (UAE) was selected for this study. This institution has 14 campuses across the UAE and all of the 14 campuses were included in the study. All faculty members in the 14 campuses received the survey invitation email along with the survey link, and some of the faculty members responded to the survey. In March 2020, the data collection process for this current study started. A total of 1,200 faculty members from the 14 campuses were emailed the survey link, of which 329 surveys were returned. This implies that the response rate in this current study is 27.4%. Before conducting the statistical analysis, data collected from participants were screened. Tabachnik and Fidell (2007), argued that three procedures should be followed in data screening as the following, first, the participant's input and the accuracy of their input should be checked. Secondly, missed values should be checked. Finally, normality and outliers must be identified and measured either univariate or multivariate. These are discussed in detail in the following sections.

##### **4.2.1.1 Data Collection Accuracy**

The first step of checking the data accuracy is going over the input entered by participants. Data gathered have been checked by the researcher to make sure that the data was entered appropriately and then the researcher categorized the input into labels. To simplify the interpretation of the data gathered from the Likert-scale items, the scores remained the same without reversing them. The lowest score which is 1 means low approximation (strongly disagree) whereas, the highest score which is 5 means high approximation (strongly agree). The participant's input was checked three times to assure the accuracy of the input. All input analyzed was within the normal range of the

Likert-scale scores. No strange or infrequent input was witnessed in this current data collection. All values of means and standard deviations were dependable and accurate.

#### **4.2.1.2 Missing Values**

In this present data collection, no missing values were detected. The rationale behind not missing any values is that the survey questions were designed into a compulsory completion of each question which alerts the participant if they missed any question. Additionally, the survey was designed in a way that the participants cannot transfer to the next question before finishing the previous ones. After completing all question then the participants will be able to submit the survey. Furthermore, it is rare to overlook values in the online version of data collection tools on account of the online setup and the handy way of presenting questions.

#### **4.2.1.3 Normality, Outliers Both Univariate and Multivariate**

After reviewing data gathered in the survey, all input scores on varied sections of the data tool were symmetric. The input of the participants was within the normal range of circulation. The survey scores were going asymmetrically in the direction of higher values (4 and 5) rather than the average values (2 and 3). Although, in every section of the input, there were negative skewness values it was satisfactory. Therefore, the faculty member's inputs were grouped on the positive side of the graph. However, the kurtosis values were positive. Even though the skewness and kurtosis values were not flawless, they can be considered and accepted because of the sample size in this study. In a larger sample size, skewness values will not affect the analysis. However, the kurtosis values can affect the analysis by undervaluing the variance and standard deviation. But in the case of this study, this problem was solved with a large sample size of 329 cases. Another deeper analysis and reflection were made on all values which discovered some multivariate and univariate outliers. Extreme outlier values were deleted from the analysis (Tabachnick & Fidell 2013).

#### 4.2.2 Demographic Details Analysis – Quantitative Design

At the very beginning of the survey before section one, three demographic questions were shown for the faculty members. The first demographic question is a drop-down menu and it was ‘Where do you work?’. Participants were given all the short names of the 14 campus of this institution such as ADW, ADM, AAW, AAM, DBM, DBW, SJW, SJM, MZC, RUC, RKM, FJW and FJM (as shown below in Table 23).

**Where do you work?**

|       |       | Frequency | Percent | Valid<br>Percent | Cumulative<br>Percent |
|-------|-------|-----------|---------|------------------|-----------------------|
| Valid | AAM   | 17        | 5.2     | 5.2              | 5.2                   |
|       | AAW   | 28        | 8.5     | 8.5              | 13.7                  |
|       | ADM   | 44        | 13.4    | 13.4             | 27.1                  |
|       | ADW   | 50        | 15.2    | 15.2             | 42.2                  |
|       | DBM   | 38        | 11.6    | 11.6             | 53.8                  |
|       | DBW   | 24        | 7.3     | 7.3              | 61.1                  |
|       | FJM   | 8         | 2.4     | 2.4              | 63.5                  |
|       | FJW   | 26        | 7.9     | 7.9              | 71.4                  |
|       | MZC   | 2         | .6      | .6               | 72.0                  |
|       | RKM   | 5         | 1.5     | 1.5              | 73.6                  |
|       | RKW   | 19        | 5.8     | 5.8              | 79.3                  |
|       | RUC   | 8         | 2.4     | 2.4              | 81.8                  |
|       | SJM   | 12        | 3.6     | 3.6              | 85.4                  |
|       | SJW   | 48        | 14.6    | 14.6             | 100.0                 |
|       | Total | 329       | 100.0   | 100.0            |                       |

[Table 23: the first question in the demographic questions of the survey]

As shown in Table 23 above, the total number of participants and the frequency is, N=329. The top highest number of participants who participated in this survey was from ADW and there were 50 faculty members. The second highest frequency was from SHJ and there were 48 faculty members. The third-highest frequency was from ADM and they were 44 faculty members. Whereas, the lowest frequency was from MZC and they were only 2 faculty members, followed by RKM and they were 5 faculty members and RUC and they were 8 faculty members. The second question is shown below in Table 24.

**What is your gender?**

|              | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------|-----------|---------|---------------|--------------------|
| Valid Female | 125       | 38.0    | 38.0          | 38.0               |
| Male         | 204       | 62.0    | 62.0          | 100.0              |
| Total        | 329       | 100.0   | 100.0         |                    |

[**Table 24:** the second question in the demographic questions]

As shown in Table 24 above, the second question of the demographic questions was ‘What is your gender?’. The total number of participants mentioned previously, is, N=329. The total number of female’s faculty in this study was less than the total number of male’s faculty. The total number of female’s faculty was 125 faculty members and they were 38% out of the total participation percentage. Whereas, the total number of male’s faculty was 204 and their percentage was 62%. The third and last question in the demographic details is shown in Table 25 below.

**What is your total teaching experience?**

|                           | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------------------------|-----------|---------|---------------|--------------------|
| Valid 0-less than 5 years | 26        | 7.9     | 7.9           | 7.9                |
| 10-less than 15 years     | 57        | 17.3    | 17.3          | 25.2               |
| 15-less than 20 years     | 83        | 25.2    | 25.2          | 50.5               |
| 20 years and more         | 121       | 36.8    | 36.8          | 87.2               |
| 5-less than 10 years      | 42        | 12.8    | 12.8          | 100.0              |
| Total                     | 329       | 100.0   | 100.0         |                    |

[Table 25: third question of demographic questions]

As shown in Table 25 above, the third is the last question of the demographic questions and it is ‘What is your total teaching experience?’ The faculty with 20 years and more of teaching experience were the majority and they were 121 faculty members and their percentage was 36.8% of this study. Whereas, the faculty with 0 to less than 5 years of teaching experience were the smallest sample size and they were 26 faculty members and their percentage was 7.9% of this survey.

#### 4.2.3 Descriptive Statistics

In this current study, a five-point Likert scale was used to measure the technology integration (TI) and BBL suitability during the COVID-19 quarantine. Paulhus (1984) claimed that the advantages of the Likert scale are that it gives the researcher the exact respondent’s degrees of opinion or even having no opinion. In this research, two types of Likert scale were used for measuring the statements of the survey such as the agreement and the extent or scope. The agreements Likert scale was used as the following – 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. It was used in section 1 and 4 of the survey. The scope or extent Likert scale

was used as the following – 1 = not at all, 2 = to a small extent, 3 = to some extent, 4 = to a moderate extent, and 5 = to a large extent. It was used in section 2 and 3 of the survey.

The numerical analysis of data falls into two main types, descriptive statistics, and inferential statistics. In this study, descriptive statistics have been conducted. Descriptive statistics are the statistics that describe, explain, and summarize the data gathered by respondents. The first step in descriptive statistics is the set of data gathered and it is known as ‘data set’. The most important question in descriptive statistics is ‘how the key characteristics of the data can be communicated?’ Another very important term in descriptive statistics is frequency distribution which is the arrangement of each special data value (Johnson & Christensen 2014). The frequency distribution is measured for the three sections. As shown in Table 26, the frequencies of section 1 (the usability of BBL during the quarantine).

### Statistics

|                |         | Motivates<br>faculty to<br>create more<br>engaging<br>student-<br>centred<br>learning<br>activities. | Enhances the<br>amount of Wi-<br>Fi connection<br>stress. | Makes<br>classroom<br>management<br>more difficult. |
|----------------|---------|--|---|---|
| N              | Valid   | 329  | 329   | 329   |
|                | Missing | 0  | 0   | 0   |
| Mean           |         | 3.63   | 3.56  | 2.92  |
| Median         |         | 4.00   | 4.00  | 3.00  |
| Mode           |         | 4  | 4   | 2   |
| Std. Deviation |         | .980   | 1.052   | 1.207   |
| Variance       |         | .960   | 1.107   | 1.457   |
| Range          |         | 4  | 4   | 4   |
| Minimum        |         | 1  | 1   | 1   |
| Maximum        |         | 5  | 5   | 5   |
| Sum            |         | 1194   | 1170  | 961   |
| Percentiles    | 25      | 3.00   | 3.00  | 2.00  |
|                | 50      | 4.00   | 4.00  | 3.00  |
|                | 75      | 4.00   | 4.00  | 4.00  |

**[Table 26:** Frequencies of section 1 scores]

The statistics in Table 26 above shows the number of valid cases and missing cases in the section. The total number of valid cases is 329 cases which is the number of participants. The number of missing cases in section 1 is 0. The mean value ranges between 2.92 to 3.63 and this is the average value. The median value is 4.00 which is the middle value and the mode value is 4 which is the value that appears the most. The frequency test contains several data as shown in Table 27.



**Makes classroom management more difficult.**

|       |       | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | 1     | 41        | 12.5    | 12.5          | 12.5               |
|       | 2     | 93        | 28.3    | 28.3          | 40.7               |
|       | 3     | 83        | 25.2    | 25.2          | 66.0               |
|       | 4     | 75        | 22.8    | 22.8          | 88.8               |
|       | 5     | 37        | 11.2    | 11.2          | 100.0              |
|       | Total | 329       | 100.0   | 100.0         |                    |

[**Table 27:** Frequency of question 10 in section 1]

As shown in Table 27 above, the frequency table covers four key columns of dimensions, the frequency, the per cent, the valid per cent, and the cumulative per cent. The frequency column indicates the total number of completed survey and its Likert scale. For example, out of 329 respondents, a total of 41 respondents chose 1 for question 10 in section 1 of the survey, 93 respondents chose 2 and this the highest value. The lowest value is 5 on the Likert scale and it was chosen by 37 respondents. There is no missing value in the frequency column.

The per cent column in the frequency table indicates the percentage of missing and none missing surveys completed in this dimension out of the total number as shown in Figure 7. The total number of valid cases is 329 and missing cases is 0. As well as the valid per cent column shows the percentage of survey completion in that dimension out of the total number of none missing responses. The ratio of the percentage was verified in both of per cent and valid per cent columns by dividing the frequency value by the total number of participants which is 329 as the following:

**1:**  $41/329= 12.5\%$

**2:**  $93/329=28.3\%$

**3:**  $83/329=25.2\%$

**4:**  $75/329=22.8\%$

**5:**  $37/329=11.2\%$

The **cumulative per cent** column is the sum percentage of the valid per cent value and the value of the cumulative percent combined. The first value is usually the same as the valid percent because there is no cumulative percent above the current one. The values of the cumulative percent column will be measured (as given below) and followed by histogram 1.

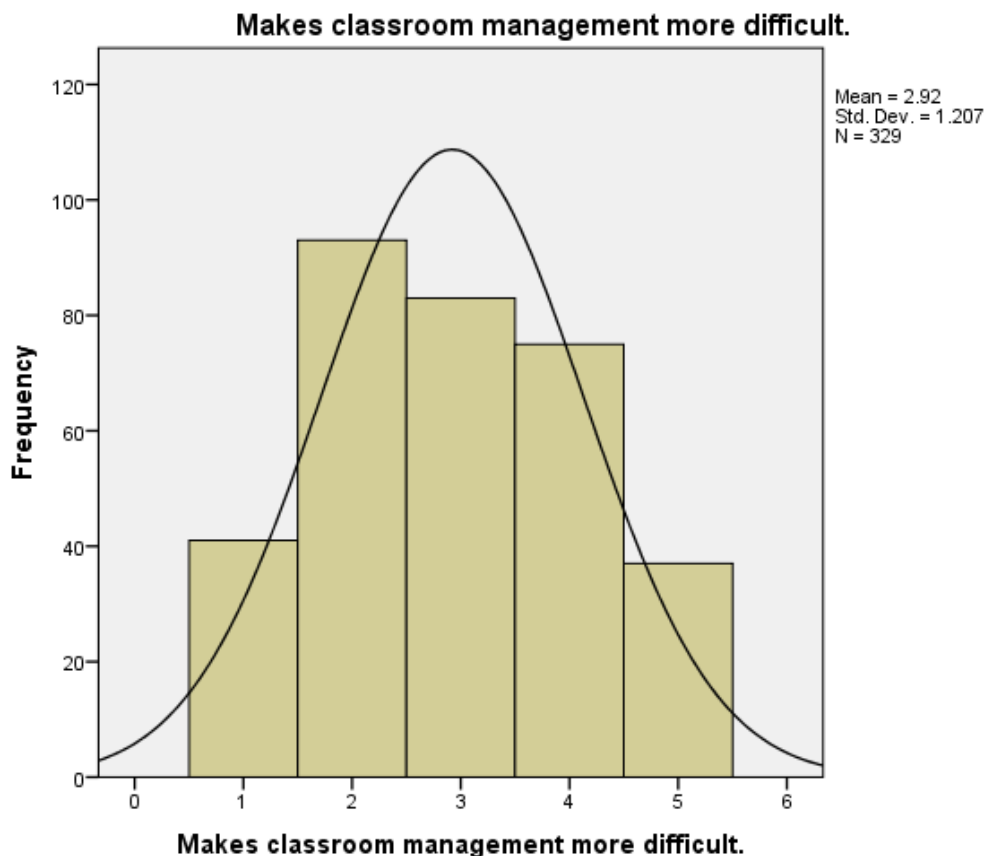
**1:** 12.5% (As there is no value above this value, thus the first cumulative percent is same to the first valid percent)

**2:**  $12.5+28.3=40.7\%$

**3:**  $12.5+28.3+25.3=66.0\%$

**4:**  $12.5+28.3+25.3+22.8=88.8\%$

**5:**  $12.5+28.3+25.3+22.8+11.2=100\%$



**[Histogram 1: The Y and X in variable 10 section 1]**

As shown in histogram 1 above, the y-axis represents the frequency measurements based on this dimension. The highest frequency is 95 and the lowest frequency is 40. Whereas, the x-axis represents the value of this variable which ranges from 1 to 5. Besides, the mean and the standard deviation values were added. The mean value in this dimension is 2.92, the value of standard deviation is 1.207, and the total number of respondents is N= 329. Another dimension of the section has been analyzed in Table 28 below.

**Motivates faculty to create more engaging student-centered learning activities.**

|       |       | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | 1     | 9         | 2.7     | 2.7           | 2.7                |
|       | 2     | 31        | 9.4     | 9.4           | 12.2               |
|       | 3     | 94        | 28.6    | 28.6          | 40.7               |
|       | 4     | 134       | 40.7    | 40.7          | 81.5               |
|       | 5     | 61        | 18.5    | 18.5          | 100.0              |
|       | Total | 329       | 100.0   | 100.0         |                    |

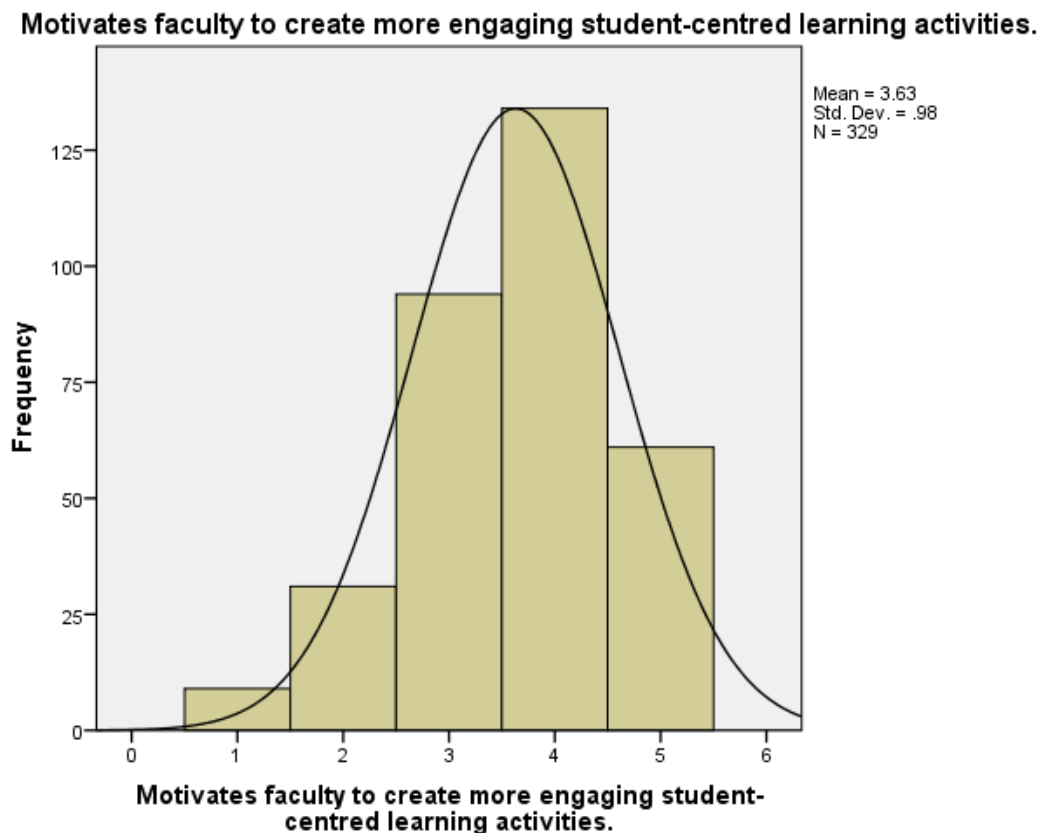
**[Table 28; Frequency of variable 8 in section 1]**

Table 28 highlights the four dimensions of variable 8 in section 1 i.e., the frequency, the percent, the valid percent, and the cumulative percent. In the frequency column, a total of 9 respondents selected 1 in variable 8 in section 1 of the survey, 31 respondents selected 2, 94 respondents chose 3, 134 respondents selected 4 which is the highest value and 61 respondents selected 5. Besides, the lowest frequency value is 9 and it is 1 on the Likert scale. There is no missing value in the frequency column.

The percent column showed above is slightly different from the data presented. The percent column included the total number of valid cases which is 329 as well as the missing cases which are 0. The ratio of percent which was verified in both of percent and valid percent columns is the same. The percent and the valid percent values in variables 8 of the section as the following:

- 1) 1=2.7%
- 2) 2=9.4%
- 3) 3=28.6%
- 4) 40.7%
- 5) 18.5%

The accumulative percent values in variable 8 of section 1 were as following: 1=2.7%, 2=12.2%, 3=40.7%, 4=81.4%, and 5=100%. As shown in Histogram 2 below, the frequency of Y and X in variable 8.



**[Histogram 2: The Y and X in variable 8 sections 1]**

As shown in histogram 2 above, the y-axis represents the frequency value and the highest frequency in this variable is 134. The lowest frequency is 9, whereas, the x-axis shows the value of variable 8 which is between 1 and 5. The mean value in this dimension is 3.63, the value of standard deviation is .98, and the total number of respondents is N= 329. Another frequency test was conducted for section 2 of the study as shown in Table 29 below

**Statistics**

Communication tools (e.g.,  
discussion boards,  
announcements, blogs, virtual  
classroom).

|                |         |      |
|----------------|---------|------|
| N              | Valid   | 329  |
|                | Missing | 0    |
| Mean           |         | 3.81 |
| Median         |         | 4.00 |
| Mode           |         | 4    |
| Std. Deviation |         | .940 |
| Variance       |         | .883 |
| Range          |         | 4    |
| Minimum        |         | 1    |
| Maximum        |         | 5    |
| Sum            |         | 1255 |
| Percentiles    | 25      | 3.00 |
|                | 50      | 4.00 |
|                | 75      | 4.00 |

**[Table 29: Frequency of variable 2 in section 2]**

As shown in Table 29 above, N=329 and the statistics of missing responses is 0. The mean of variable 2 of section 2 is 3.81, the median is 4.00 and the mode is 4. The standard deviation value is 0.940, and the variance value is 0.883. The minimum statistics in variable 2 of section 2 is 1, and the maximum statistics is 5. The frequency test contains several varied data as shown in Table 30 below.

**Communication tools (e.g., discussion boards, announcements,  
blogs, virtual classroom).**

|       |       | Frequency | Percent | Valid Percent | Cumulative<br>Percent |
|-------|-------|-----------|---------|---------------|-----------------------|
| Valid | 1     | 6         | 1.8     | 1.8           | 1.8                   |
|       | 2     | 25        | 7.6     | 7.6           | 9.4                   |
|       | 3     | 70        | 21.3    | 21.3          | 30.7                  |
|       | 4     | 151       | 45.9    | 45.9          | 76.6                  |
|       | 5     | 77        | 23.4    | 23.4          | 100.0                 |
|       | Total | 329       | 100.0   | 100.0         |                       |

[Table 30; Frequency of variable 2 in section 2]

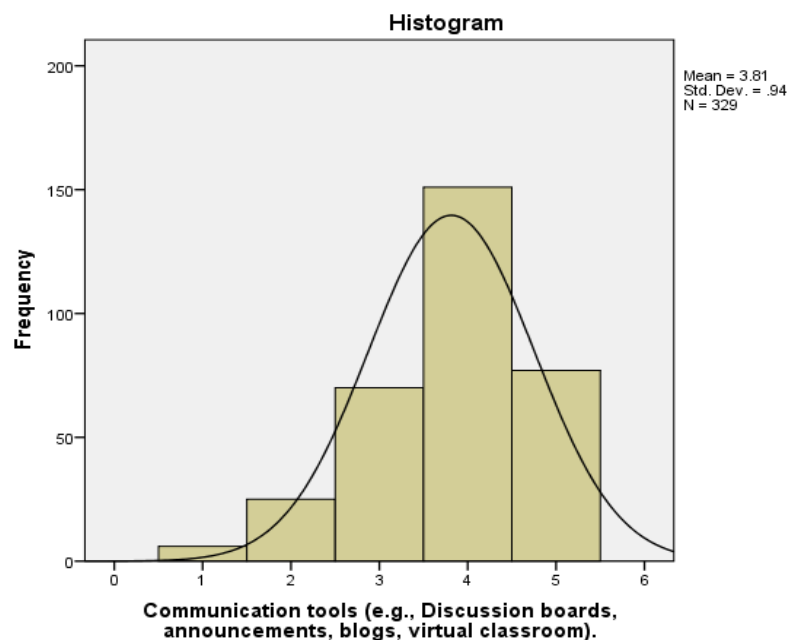
Table 30 above covers the four dimensions of variable 2 in section 2 in the following manner: the frequency, the percent, the valid percent, and the cumulative percent. Frequency statistics is different from section 1 discussed previously. As evidenced in the frequency column, a total of 6 respondents picked 1 in variable 2 in section 2 of the survey, 25 respondents picked 2, 70 respondents picked 3, 151 respondents picked 4 and this is the highest value, and 77 respondents picked 5 in the Likert scale. Whereas, the lowest frequency value is 6 and it is 1 on the Likert scale. There are no missing values in the frequency column.

The percent column showed above in Figure 15 is a little different from the data presented in Figure 10 and Figure 12. Yet again the ratio of percent column is the same as the valid percent due

to not missing any values in this study. The percent value and the valid percent value in variable 2 of section 2 are measured as the following:

- 1) 1=1.8%
- 2) 2=7.6%
- 3) 3=21.3%
- 4) 45.9%
- 5) 23.4%

Accordingly, the accumulative percent values are different in this variable, the accumulative percent values were calculated as the following: 1=2.7%, 2=9.4%, 3=30.7%, 4=76.6%, and 5=100%. Histogram 3 shows the frequency of Y and X in variable 2 in section 2.



[Histogram 3: The Y and X in variable 2 section 2]

As presented in histogram 3 above, the y-axis represents the frequency value. It ranges from 0 to 200. As mentioned previously, the highest frequency in this variable is 151 while the lowest frequency is 6. The x-axis presents the value of variable 2 in section 2 which is from 1 to 5. The

mean value in this variable is 3.81, the value of standard deviation is .94, and the number of inputs N= 329. Additional frequency test was conducted for variable 1 in section 3 of the study as shown in Table 31 below.

### Statistics

Internet connection issues hinder  
the use of BBL (Wi-Fi).

|                |         |       |
|----------------|---------|-------|
| N              | Valid   | 329   |
|                | Missing | 0     |
| Mean           |         | 3.44  |
| Median         |         | 3.00  |
| Mode           |         | 3     |
| Std. Deviation |         | 1.147 |
| Variance       |         | 1.315 |
| Range          |         | 4     |
| Minimum        |         | 1     |
| Maximum        |         | 5     |
| Sum            |         | 1133  |
| Percentiles    | 25      | 3.00  |
|                | 50      | 3.00  |
|                | 75      | 4.00  |

**[Table 31:** Frequency of variable 1 in section 3]

As shown in Table 31 above, the frequency of variable 1 in section 3 is tested. The variable is ‘Internet connection issues hinder the use of BBL (Wi-Fi)’. The number of responses i.e., N=329. There were no missing responses. The mean value in variable 1 of section 3 is 3.44. The median value is 3.00, and the mode value is 3. The value of the standard deviation is 1.147. The minimum frequency value is 1 and the maximum frequency value is 5. Four main related values will be discussed as shown in Table 32 below.



**Internet connection issues hinder the use of BBL (Wi-Fi).**

|       |   | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|---|-----------|---------|---------------|--------------------|
| Valid | 1 | 23        | 7.0     | 7.0           | 7.0                |
|       | 2 | 39        | 11.9    | 11.9          | 18.8               |
|       | 3 | 103       | 31.3    | 31.3          | 50.2               |
|       | 4 | 97        | 29.5    | 29.5          | 79.6               |
|       | 5 | 67        | 20.4    | 20.4          | 100.0              |
| Total |   | 329       | 100.0   | 100.0         |                    |

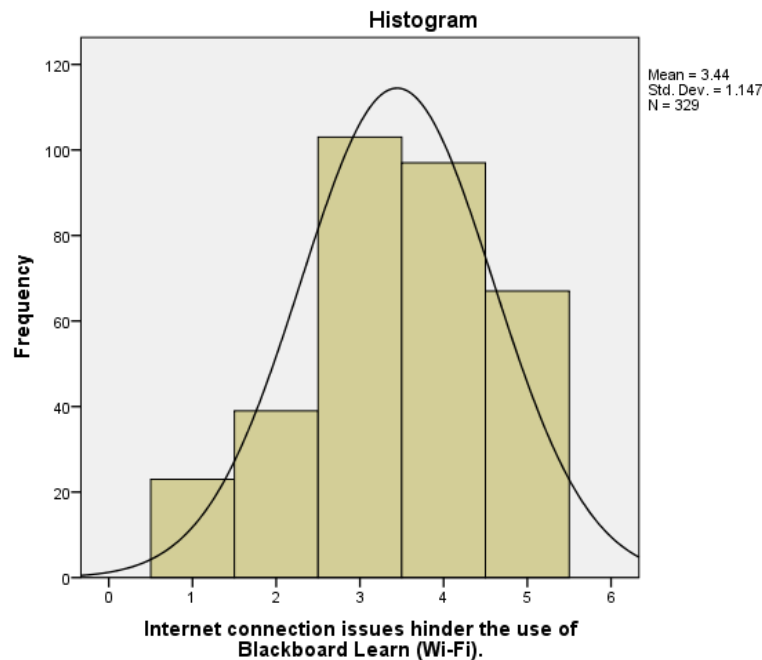
**[Table 32: Frequency of variable 1 in section 3]**

Table 32 above presents the four dimensions of variable 1 in section 3 – the frequency, the percent, the valid percent, and the cumulative percent. Frequency statistics is dissimilar to section 1 and section 2. In the frequency column, a total of 23 participants indicated 1 in variable 1 in section 3 of the survey, 39 participants indicated 2, 103 participants indicated 3 and this is the highest value, 97 participants indicated, and 67 participants indicated 5 in the Likert scale. Whereas, the lowest frequency value is 23 and it is 1 on the Likert scale. Previously the lowest frequency value ranges between 3 and 6, whereas in this variable it is quite higher than the previous values because this a question written in a negative context. There are no missing values in the frequency column.

The percent column shown in Table 20 above is a little different from the data presented earlier. The ratio of the percent column and the valid percent are identical. The percent value and the valid percent value in variable 1 of section 3 are measured as following:

- 1) 1=7.0%
- 2) 2=11.9%
- 3) 3=31.3%
- 4) 4=29.5%
- 5) 5=20.4%

In light of the above, the accumulative percent values are altered in this variable and are measured as follows: 1=7.0%, 2=18.8%, 3=50.2%, 4=79.6%, and 5=100%. As per histogram 4 shown below, the frequency of Y and X in variable 1 in section 3 are be covered.



**[Histogram 4, the Y and X in variable 1 section 3]**

As covered in Histogram 4 above, the y-axis covers the frequency value. It starts from 0 to 120. As mentioned previously in the frequency statistics, the highest frequency in this variable is 103. However, the lowest frequency is 23. The x-axis presents the value of variable 1 in section 3 which is from 1 to 5. The mean value in this variable is 3.44, the value of standard deviation is 1.147, and the number of inputs represented by N= 329.

#### 4.2.4 Correlational Analysis

In this present study, a correlational analysis has been used to discuss the correlation between the main dimensions of the study. The linear relationship between variables is discussed as well. A correlation test is used to show how variables are correlated and check the relationship between the quantitative variables. Correlation among variables, whether negative or positive, is important because it can affect the practices or behaviors of individuals within the context of education and healthcare (Glen 2020). Table 32 shows the correlation matrix for Blackboard domains.

A key term used in correlational statistics and correlational analysis is the correlation coefficient. The correlation coefficient can be defined as adding a value to measure the relationship to find out the type of relationship between the variables. The correlation coefficient has three values: it can be -1, 1, and 0. -1 means that the variables have a negative relationship, 1 means the variables have a positive relationship, 0 means there is no relationship among variables. The most known and utilized correlation coefficient in social sciences is the Pearson correlation coefficient. In this current study, a Pearson correlation coefficient was used to test the linear correlations among the research input (Glen 2020).

**Correlations**

|  |                     |   |  |   |
|--|---------------------|---|--|---|
|  |                     | Digital learning content (e.g., E-textbooks, Supports faculty in meeting their teaching objectives. | tutorials, inpractices, lesson-plans, slides, course-outline). | Internet connection issues hinder the use of BBL (Wi-Fi). |
| Supports faculty in meeting their teaching objectives. | Pearson Correlation | 1   | .488**   | -.022   |
|  | Sig. (2-tailed)     |   | .000   | .696  |
|  | N                   | 329   | 329  | 329   |

|  |   |                       |                     |                     |
|--|---|-----------------------|---------------------|---------------------|
| Digital learning content<br>(e.g., E-text books,<br>tutorials, practices,<br>lesson-plans, slides,<br>course-outline). | Pearson Correlation<br>Sig. (2-tailed)<br>N | .488**<br>.000<br>329 | 1<br><br>329        | .048<br>.038<br>329 |
| Internet connection<br>issues hinder the use of<br>BBL (Wi-Fi).  | Pearson Correlation<br>Sig. (2-tailed)<br>N | -.022<br>.696<br>329  | .048<br>.386<br>329 | 1<br><br>329        |

\*\*. Correlation is significant at the 0.01 level (2-tailed).

[Table 33, the correlation matrix for Blackboard domains]

As shown in Table 33 above, three domains of the study were included in the correlation analysis. The main question in each section was selected for the first three sections only, as section four is related to the previous sections and section five is based on two open-ended questions. There are two types of correlations among variables, a positive correlation, and a negative correlation. The relationship between the variable and itself is always significant as it is always 1 and it is not an important correlation. The relationship among two different variables, on the other hand, is important. A correlation among variables is statistically significant only if the significance level, that is, “Sig. (2-tailed)”, is more than 0.05 ( $<0.05$ ) (Berg 2014).

Based on the correlational statistics presented in Table 22 above, the strongest negative relationship is between variable 3 which is ‘Internet connection issues and Wi-Fi’ and variable 1 which is ‘Faculty meeting their teaching objectives. The value of the relationship is -.022. Accordingly,  $r = -.022$ ,  $N = 329$  faculty members and its 2-tailed significance,  $p = 0.696$  which means that the correlation is not significant between variable 1 and variable 3. A positive relationship between variable 1 which is ‘Faculty meeting their teaching objectives’ and variable 2 which is ‘Digital learning content’ was also observed. Accordingly,  $r = 0.488^{**}$  based on  $N = 329$  faculty members and its 2-tailed significance,  $p = 0.000$  which means it is highly significant. Another positive relationship between variable 2 ‘Digital learning content’ and variable 3 ‘Wi-Fi

issues' has been observed. Accordingly,  $r = .048$  and its 2-tailed significance,  $p = 0.038$  which is less than 0.05 and that imply that variable 2 and 3 are significantly correlated.

To sum up, the correlation statistics results presented a good amount of fit and correlation among variables in this study. The correlation statistics showed that the domains are correlated using the revised survey of technology integration (TI) in the case of BBL from the faculty's perspectives at the higher education level. Either positive or negative relationship is important and all together are explaining the utilization of BBL.

#### 4.2.5 One sample t-tests

**Research Question 1:** How do faculty perceive the suitability of BBL as the main source of their professional development during the quarantine period (COVID-19) in the UAE?

A one-sample t-test was done to examine the differences in the usability of technology integration (TI) in the case of BBL in creating assessments for their students at the higher education level. Table 34 below demonstrates the mean, the standard deviation and the standard error mean.

| One-Sample Statistics  |     |      |                |                 |
|--|-----|------|----------------|-----------------|
|  | N   | Mean | Std. Deviation | Std. Error Mean |
| Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign). | 329 | 3.79 | .961           | .053            |

[Table 34: one-sample t-test statistics]

As shown in Table 34 above, in the t-test statistics one item was selected from the survey from section 2. This variable is about creating assessments either creating test polls, survey, using save-and-sign or brainstorming. The total number of participants is  $N = 329$ . The mean of assessments

is  $M = 3.79$ . The standard deviation is  $SD = 0.961$ . The standard error mean is  $SEM = 0.053$ . If  $\alpha \geq 0.05$  then the test is not significant. The sample of assessment is significantly different as  $M=3.79$ . However, the one-sample test scores were different as shown in Table 35 below.

**One-Sample Test**

|  | Test Value = 3 |     |                 |                 |   |       |
|--|----------------|-----|-----------------|-----------------|---|-------|
|  | t              | df  | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference |       |
|  |                |     |                 |                 | Lower                                     | Upper |
| Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign). | 14.854         | 328 | .000            | .787            | .68                                       | .89   |

[Table 35: one-sample t-test]

As shown in Table 35, the test value is 3,  $t = 14.854$ , and the degree of freedom is  $df = 328$ . The sig (2-tailed) is .000 and that means that the test is significant. It has been observed that  $\alpha \leq 0.05$ , indicating that the test is significant. Faculty members who were surveyed have a significant perception of assessments utilized in BBL,  $t(328) = 2.112$ ,  $p = 0.000$ . Faculty members found the blackboard a suitable tool during the COVID-19 quarantine.

#### 4.2.6 Analyses of Variance

ANOVA test is a way to check the significance of the study results. It is a way to guide the researcher to reject the research hypothesis and find an alternative hypothesis or accept the research hypothesis. ANOVA tests the groups and compares them to discover the dissimilarities between them. There are two types of ANOVA tests, one-way and two-way. In this current study, a one-way ANOVA test was conducted. This type of test focuses on one independent variable. The independent variable is BBL as shown in Table 36 below.

### ANOVA

Communication tools (e.g., discussion boards, announcements, blogs, virtual classroom).

|                | Sum of Squares | df  | Mean Square | F      | Sig. |
|----------------|----------------|-----|-------------|--------|------|
| Between Groups | 92.150         | 4   | 23.038      | 37.786 | .000 |
| Within Groups  | 197.539        | 324 | .610        |        |      |
| Total          | 289.690        | 328 |             |        |      |

[Table 36: One-way ANOVA test]

As shown in Table 36 above, the significance is Sig = 0.000, which is the probability level. The independent variable is the faculty member as they are the only group in this study. Whereas the dependent variable in this test is the communication tools used within BBL such as discussion boards, announcement, blogs, and the virtual classroom of Collaborate Ultra. The value of ANOVA F statistics is  $F = 37.786$ . The higher the F value level gets, the lower the Sig value goes. Therefore, the communication tools do significantly influence the faculty members teaching objectives.

#### Faculty members from all campuses

All faculty members from the different campuses were included in this study of technology integration through the use of BBL in the analysis to explore if there is a difference after utilizing this kind of digital tool in higher education during the COVID-19 quarantine. Both genders, that is females and males, were included too. As shown in Table 37 below, none of the cases was excluded.

### Case Processing Summary

|   | Cases    |         |          |         |       |         |
|---|----------|---------|----------|---------|-------|---------|
|   | Included |         | Excluded |         | Total |         |
|   | N        | Percent | N        | Percent | N     | Percent |
| Where do you work? *                    |          |         |          |         |       |         |
| What is your total teaching experience? | 329      | 100.0%  | 0        | 0.0%    | 329   | 100.0%  |

[Table 37: the summary of cases]

As shown above, in Table 37, the total number of participants who were included is N = 329. The percentage of included is 100%, implying that the excluded case was zero. Thus, the percentage of excluded cases is 0.0%. The total percent participation is 100%. The amount of experience differs between participants as shown in Table 38 below.

### Report

Where do you work?

| What is your total teaching experience? | N   |
|---|-----|
| 0-less than 5 years                     | 26  |
| 10-less than 15 years                   | 57  |
| 15-less than 20 years                   | 83  |
| 20 years and more                       | 121 |
| 5-less than 10 years                    | 42  |
| Total                                   | 329 |

[Table 38: Participants years of experience]

As shown above, the amount of experience is key in this study. As the faculty members who had more years of experience were integrating the technology for a very long time and using BBL



years ago before some other faculty members. The more they integrate the technology the more they are more comfortable using BBL and other digital tools. As shown in the above Figure 25, the faculty member with 20 years and more was the biggest number of participants and they were 121. Whereas, the lowest number of participants were the ones with the least experience of 0 to less than five years and they were 26 faculty members.

### **4.3 The Quantitative Results**

In the quantitative part of the study, three quantitative questions directed this study as the following:

**Research Question 1:** How technology integration in higher education is occurring in the UAE? And how do faculty members perceive the usability of BBL?

The possible conclusion and result fell in this quantitative question will be highlighted below. To calculate the suitability of BBL by faculty members, the survey used in the study conducted by Mundy, Kupczynski, and Kee (2012) was revised. It was revised to create a survey that fits the current context of remote learning and the context of the United Arab Emirates (UAE). To assure the construct validity of the revised survey, principal component analysis was completed. The findings revealed that the revised survey, which has 4 dimensions, has an appropriate and acceptable level to fit the use of this survey in this existing study. Besides, the revised survey reliability and its 4 dimensions have been checked with Cronbach's alpha ( $\alpha$ ) the value of the subscales ranges from 0.734 to 0.901 for each scale in the survey ( $\alpha = 0.734$  to 0.901).

**Research Question 2:** What are the trends and developments accounted for in the literature on technology integration in higher educational institutions in the UAE?

Descriptive statistics showed that the faculty members were using BBL tools to a large extent during the quarantine period (COVID-19) in the UAE. The maximum score is 5 which indicates 'to a large extent for the technology integration. The lowest, on the other hand, is 1 which indicates 'not at all. The overall status of faculty members integrating technology seems to be very high. Further, detailed qualitative analysis will be covering this point to provide more clarity in this point and explain the high scores in this concept which is the integration of Blackboard Lean tools and

adding some possible ways to add beneficial education tools within the use of BBL in higher education during the remote learning as shown in Table 39 below.

**Descriptive Statistics**

|  | N   | Minimum | Maximum | Mean | Std. Deviation |
|--|-----|---------|---------|------|----------------|
| Digital learning content<br>(e.g., E-text books,<br>tutorials, practices,<br>lesson-plans, slides,<br>course-outline). | 329 | 1       | 5       | 3.96 | .874           |
| Communication tools<br>(e.g., Discussion boards,<br>announcements, blogs,<br>virtual classroom).                       | 329 | 1       | 5       | 3.81 | .940           |
| Organizational tools<br>(e.g., Weekly learning<br>modules, calendar,<br>record keeping, lesson<br>plan).               | 329 | 1       | 5       | 3.71 | .956           |
| Analytical tools (e.g.,<br>Grade book, student<br>retention center)  | 329 | 1       | 5       | 3.85 | .938           |
| Recreational tools (e.g.,<br>games)  | 329 | 1       | 5       | 2.93 | 1.223          |
| Assessments (e.g.,<br>Brainstorming, test<br>polls, surveys, save-and-<br>sign).                                       | 329 | 1       | 5       | 3.79 | .961           |

|   |     |   |   |      |      |
|---|-----|---|---|------|------|
| Interactive- Audio visual<br>(e.g., YouTube videos,<br>voice recording tools,<br>filming tools) | 329 | 1 | 5 | 3.69 | .934 |
| Expressive tools (e.g.,<br>word processing, on-line<br>journal)                                 | 329 | 1 | 5 | 3.37 | .983 |
| Evaluation tools (e.g.,<br>assignments, e-portfolio,<br>testing)                                | 329 | 1 | 5 | 3.93 | .831 |
| Informative tools (e.g.,<br>Web-links)  | 329 | 1 | 5 | 3.79 | .859 |
| Valid N (listwise)  | 329 |   |   |      |      |

[Table 39: Descriptive statistics of research question 2]

Ten items in section two which is tailored to answer research question 2. The descriptive statistics show that N=329, the maximum is 5, and the minimum is 1. The Mean value ranges between the ten items of section 2 in the survey. The lowest mean value M=2.93. The highest mean value is M = 3.97. The standard deviation ranges between, 0.832 and 1.223.

**Research Question 3:** How is BBL used to realize the technology integration in the higher educational institutions in the UAE?

Descriptive statistics showed that certain external factors are challenging the faculty teaching practices technically to a moderate extent during the quarantine period (COVID-19) in the UAE. The highest score is 5 and the lowest score is 1. The mean value is M = 3.44 in variable 1 and M = 3.3.5 in variable 2 as shown below in Table 40.

### Descriptive Statistics

|   | N   | Minimum | Maximum | Mean | Std. Deviation |
|---|-----|---------|---------|------|----------------|
| Internet connection issues hinder the use of BBL (Wi-Fi). | 329 | 1       | 5       | 3.44 | 1.147          |
| Availability of BBL support staff.                        | 329 | 1       | 5       | 3.35 | 1.117          |
| Valid N (listwise)  | 329 |         |         |      |                |

[Table 40, Mean of research question 2]

As shown above in Table 40, the standard deviation is  $SD = 1.147$  in variable 1 and  $SD = 1.117$  in variable 2. The overall status of external factors that challenge the faculty teaching technically is quite high as well. More qualitative insights will be added in this certain point to cover a better picture of the faculty members' technical challenges in integrating technology and using BBL remotely.

#### 4.3.1 Summary of Quantitative Results

This chapter analyzed data gathered from participants through 33 questions and 329 in-depth surveys with faculty members in the UAE. This analysis addresses the first three questions of the research questions concerning the technology integration and the usability and suitability of the BBL.

The qualitative questions are as follows:

- Faculty members found BBL to be a suitable and useable tool that can be used as the main source of teaching and learning in higher education during the quarantine period in the UAE. This software enabled the faculty members to deliver the content and do the basic teaching roles online such as teaching virtual lessons, marking student's work, giving

student's feedback, advising students, discussing content-related topics, and doing online exams. The main issue faced was related to proctoring the exams.

- An average to high extent of BBL's tools was integrated into the faculty teaching practices in the higher education level during the quarantine period (COVID-19) in the UAE. Thus, the key trend was using the basic features in BBL. However, the faculty can use many more features to improve the overall experience. The most common issue faced by the faculty members in operating the BBL was connectivity.
- Technology integration was implemented using BBL and it was used extensively within the educational institute. The features that were commonly used include the Announcements, the Discussion Board, Collaborate Ultra and the Rubrics.

Based on faculty member's views, the following uses of BBL tools were used to a high extent;

- Faculty members found BBL supportive to meet their teaching objectives to a high extent during the online learning.
- BBL provided an easy and quick access to instructional materials to a high extent.
- To a high extent, BBL enhanced the use of digital content such as, tutorials, stimulations, lesson plans, and course outline.
- To a high extent, BBL boosted faculty to create assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).
- To a high extent, BBL allowed faculty to prepare interactive- audio visual (e.g., YouTube videos, voice recording tools, filming tools)
- To a high extent, BBL allowed faculty to use expressive tools (e.g., word processing, on-line journal).

- To a high extent, BBL allowed faculty to use evaluation tools (e.g., assignments, e-portfolio, testing)
- To a high extent, BBL permitted faculty to use informative tools (e.g., Web-links).
- To a high extent, BBL helped faculty to develop and adopt new teaching techniques and methodologies.
- To a high extent, BBL allowed faculty to act more as a guide pointing the students in the right direction.
- To a high extent, BBL improved the use of analytical tools (e.g., Grade book, student retention center)

Based on faculty member's views, the following uses of BBL tools were used to an average extent;

- BBL enhanced faculty interaction with their students to an average extent.
- BBL developed faculty communication skills to an average extent.
- BBL's tools allowed faculty to be a facilitator rather than an information provider to an average extent.
- BBL limited the faculty's instructional materials to an average extent. For example, the use of E-text books.
- To an average extent, BBL eased the pressure of preparing of teaching materials through using a reusable materials.
- BBL cannot accommodate the faculty's teaching styles to an average extent.
- To an average extent, BBL motivated faculty to use more engaging student-centered learning activities.
- To an average extent, BBL increased the amount of WiFi stress and internet connections stress.

- To an average extent, BBL improved the communication skills via discussion boards, announcements, discussion boards, blogs and virtual classrooms.
- To an average extent, BBL developed the use of organizational tools (e.g., Weekly learning modules, calendar, record keeping, and lesson plan).
- To an average extent, faculty thought that internet connection issues hinder the use of Blackboard Learn (Wi-Fi).
- To an average extent, faculty assumed that availability of BBL support staff impacted the usability of BBL.
- To an average extent, faculty members believed that using BBL tools more would create a disconnect between the students and the faculty (Less social interaction)

Based on faculty member's views, the following uses of BBL tools were used to a low extent;

- Faculty members believed that BBL facilitated their collaboration with other faculty members to a low extent.
- To a low extent, BBL made the classroom management more difficult.
- To a low extent, BBL enhanced recreational tools (e.g., games).
- To a low extent, faculty argued that using BBL took up too much time.
- To a low extent, BBL intimidated and threatened faculty.

#### **4.4 Analysis of Qualitative Data**

In this part of chapter 4, an in-depth analysis of qualitative data is included. The data tool used to gather the quantitative data which is a questionnaire has also been analyzed. Also, quotes from the faculty members' responses are studied. In conclusion, a summary of the qualitative results is discussed based on the questions outlined in the questionnaire.

#### 4.4.1 Participants of the Qualitative Study

From the same institution and the same faculty members who completed the survey, some of them were interested to provide further information about the topic. Hence, they were asked to complete an online questionnaire. A total of 14 faculty members completed this questionnaire online from different campuses around the UAE (as shown in Table 30 below 5). The way of analyzing questionnaire data was utilizing an open coding method to examine the qualitative input given by the faculty members. Each question in the questionnaire has been captured and analyzed. The analysis will start with four demographic questions analysis as shown below in Table 41.

| Faculty campus | Training hours | Technology proficiency level | Years of experience |
|----------------|----------------|------------------------------|---------------------|
| ADM            | 40             | Average                      | 15-20 years         |
| AAW            | 45             | Average                      | 10-15 years         |
| AAM            | 60             | Average                      | 10-15 years         |
| DBW            | 62             | Average                      | 10-15 years         |
| DBM            | 55             | Average                      | 10-15 years         |
| RUC            | 50             | Average                      | 10-15 years         |
| RKW            | 48             | Average                      | 15-20 years         |
| FJM            | 55             | Average                      | 15-20 years         |
| RKM            | 60             | Average                      | 15-20 years         |
| FJW            | 100            | Average                      | 10-15 years         |
| SJW            | 80             | Average                      | 15-20 years         |
| SJM            | 65             | Average                      | 15-20 years         |
| MZC            | 42             | Average                      | 15-20 years         |

[Table 41: Demographic information of the questionnaire participants]



As mentioned above in Table 41, 14 faculty members participated in the questionnaire. One faculty member from each campus took part in the study. All the participants had more than 40 hours of training on 'ways to integrate technology and use digital tools. The highest number of training hours was 100 hours from the FJW campus, and the lowest number of training hours was 40 hours from the ADW campus. All the participants had an average proficiency level in technology combined with more than 15 years of experience.

#### **4.4.1.1 Faculty's Number of Professional Training Hours**

The first question in the demographic part of the questionnaire was the following: 'Number of professional training hours attended in a year'. Faculty were asked about the number of hours they did professional training a year. All the 14 faculty members did more than 40 hours of professional training a year. That means that they have had decent background information about technology integration (TI) and the use of BBL at the higher education level. The percentage of faculty who did more than 40 training hours a year is 100%.

#### **4.4.1.2 Level of technology proficiency of Faculty**

The second question of the demographic questions is about the level of technical proficiency. Ten out of fourteen faculty members mentioned that they are in an advanced level of technical proficiency as they acquired the ability to use their technical skills competently and they have become experts in this field of educational technology. However, two of the faculty members believed that they are at an average level of technical proficiency. They can demonstrate a common competency in several applications used in the education division of higher education. The percentage of advanced level is 80% and the percentage of average level is 20% in this current study.

#### **4.4.1.3 Views on the Use of BBL during the Quarantine**

The first question in the questionnaire is 'How often do you use BBL during the quarantine?' All faculty members used the BBL during the quarantine on the daily basis. The faculty member

claimed to not only use the tool during the virtual classroom and the live streaming of remote teaching but also in between the classes. They claimed to use it to announce news and send reminders for the assignment's deadlines and emailing the class list via the announcements in the BBL. Besides, BBL was used to create discussion boards with the students and allow the students to interact with classmates and reflect on their ideas. Faculty 1 explained that *'I use BBL for every class and between class for announcements, emailing to class, etc.,'* whereas Faculty 2 mentioned that *'I use BBL the whole working day during a teaching semester'*. Faculty 3 argued that *'BBL was a huge help for me as a teacher and my learners. That's because it is a good friend of mine as it helped me to research my students anytime and anywhere.'*

Hence, BBL is used by faculty to the maximum level during the whole working day in higher education either in traditional teaching ways or in remote learning. However, even though the access was daily, it was not used to the fullest potential. Most of the features on BBL were not used by faculty members due to the lack of knowledge. The faculty members tended to use the basics features of BBL only. There is a potential that it would be a great learning experience for the students if the teachers are fully trained to use the technology and BBL.

#### **4.4.1.4 Purpose of BBL during the Quarantine**

The second question in the questionnaire is 'For what purpose do you use BBL?' Faculty members used the BBL for several academic purposes both by the faculty as well as the students. The faculty use BBL to upload important teaching folders that include E-textbooks and other teaching worksheets and materials. Faculty members share the weekly plans with other faculty members who are teaching the same course via BBL. Additionally, BBL is used to upload important study materials for students, assess their work, and grade their formative and summative assessments. Furthermore, it is the main source of meeting students during the COVID-19 quarantine through Collaborate Ultra (CU) virtual teaching.

Faculty 11 explained *'Everything class-related. I have all resources for students there, in weekly folders, assessments, grading, announcements, etc. I also have a hidden folder for instructor resources. This is also where we access Collaborate for online classes. Whereas, faculty 5*

explained *‘Creating tests, recording weekly lectures, FWAs, homework, reading materials, some content related videos, announcing the news, using the calenderer to remind them of due dates etc.’*. Another Faculty 3 explained that *‘Apart from teaching and learning purposes of BBL, I joined many virtual PDs and did many professional development training hours online with BBL’*.

Based on the faculty’s response, it seems that BBL was a purposeful, functional and handy tool to be used during the quarantine as it assisted the faculty to complete a number of teaching and learning essential roles such as, setting tests, record lectures and upload it in the course, upload videos, pictures, PDF’s and other reading materials. BBL was beneficial for the faculty’s professional development courses as well. Faculty members were able to join many online PDs when convenient for them through BBL.

#### **4.4.1.5 Views of Remote Education and BBL**

The third question in the questionnaire is ‘what are your views on BBL’s use in remote education and why?’ All faculty members believed that BBL is an excellent tool to be used in remote learning since the learning and teaching were going smoothly during that time. Of Couse the faculty faced minor issues but, in general, it proved to be a great digital tool to be utilized for teaching undergraduate students in higher education.

As explained by faculty 5 *‘It would have been much more difficult to teach remotely without a solid and well-functioning LMS system such as Blackboard, it was such a good help for of us, some other tools used for remote teaching was not as good as BBL such as zoom, it was limited and don’t have all the features that BBL has’*. Also, faculty 5 agreed that *‘It is an excellent teaching and learning tool for both faculty and students, during the remote teaching we used more thus or experience of using this technology gets better and better*. In addition to that, faculty 6 cited that *‘Without technology and BBL, students will not continue the learning process and will not learn at all, it did an outstanding job to presume the education circle during this difficult time’*.

As mentioned above, faculty members find BBL to be a useful digital tool. The faculty believed that it would be too challenging to deliver a course without using BBL software. Thus, all faculty

members agreed on the effectiveness of BBL and how it was a suitable and handy tool during the COVID-19 pandemic. Faculty members also found BBL useful for traditional teaching as well.

#### **4.4.1.6 Views of Lockdown and BBL in the UAE**

The fourth question and the last question of section one is ‘How in your view BBL was used during lockdown due to COVID19 in the UAE?’ That is, the faculty members were asked about their views about the utilization of BBL during the lockdown in the UAE. Generally, the BBL was used widely and extensively in higher education in the UAE during this challenging period.

As faculty 12 mentioned that *‘Extensively! To access Collaborate, resources, Assessments, grades, announcements, etc.* Whereas, faculty 8 mentioned that *‘Very efficiently, we were able to teach online using this tool and create reliable and valid assessments.* Faculty 14 agreed that *‘this tool has been used extensively during the quarantine; way more than it was used before this pandemic’.* Faculty 12 argued that *‘Working from home ‘WFH’ was all about working on BBL, either marking, planning or uploading materials, I spend 90% of my working hours on BBL and the 10% I spend it on checking my email and replying to emails.*

As a result, this tool was used extensively at the higher education level before and after the quarantine in the UAE. Faculty members spent much of their working time, on the BBL for performing different teaching roles. It was also observed that students also use BBL to check the content, submit their assignments and check their grades. BBL was used even more than ever, during the pandemic.

#### **4.4.1.7 Faculty’s Motivation Using BBL**

The first question in section two of the questionnaire was about the faculty’s motivation, which is ‘What motivates you to create more engaging learning activities using BBL tools?’ Faculty were asked about their motivation to engage students in BBL. The faculty’s answers were varied in this question, they did not give alike answers to the previous questions.

Faculty 3 explained what motivates faculty is *'All the PD I was able to complete during online learning, such as Studymate and all the other PDs were prepared for teacher to improve their technology proficiency level'*. On the other hand, faculty 6 mentioned that what motivates faculty is *'Online support and time constraints'*. Faculty 2 argued that *'being fully aware of additional tools that I can embed within BBL will definitely engage students and myself to learn more and teach better'*.

Therefore, it is apparent that the faculty's needs are different and their ways of engaging with students are different as well. Some faculty can add more interactive online tools within BBL and using some online games along with the online lectures. Others needed more online support from the technical experts to improve the overall teaching practice. Some others were motivated by attending more professional development courses and gaining greater confidence in integrating technology and using BBL.

#### **4.4.1.8 Students' Motivation Using BBL**

In this question 'What type of tools in Blackboard Lean motivate the students to learn?' faculty members gave dissimilar answers. Faculty 10 mentioned that what motivate students is *'Interactive activities, such as Studymate'*. A total of 9 faculty members mentioned that it is essential to plan for good interactive activities with students through BBL. The secret of motivating students to learn is the type of activities prepared by the teachers and this is what keeps the teaching and learning going effectively. On the other hand, faculty 9 believed that *'Breakout sessions and online tests, effective and precise feedback'* In addition to that, faculty 7 believed that *'flipped lesson motives the students to learn when the students act like as the teacher and teach a certain topic in Collaborate Ultra and when the teacher changes the role of the student to a presenter'*.

It is apparent that providing constructive ongoing feedback is effective in motivating the students to work harder, address the teacher's comments, and perform better. In addition, asking students to actively learn by giving them the chance to teach through the flipped classroom, has been observed to cause definitive improvement in their understanding and their motivation to learn.

Using new applications such as ‘Prezi and Padlet’ within BBL would be beneficial for the student’s learning.

#### **4.4.1.9 Student-Centered Activities in BBL**

The ninth question of the questionnaire is ‘What supports you to create more student-centered activities?’ Faculty were asked what supports them to do more student-centered activities, varied answers were given in this question such as the following. Faculty 8 mentioned that *‘I like to make activities that I know students will enjoy. They seem to be more comfortable with technology, so I must incorporate this in fun enjoyable (but educational) ways’*. Whereas, faculty 2 reported that *‘what supports faculty is providing enough assistance when needed and offer a lot of workshops to enrich the faculty experience’*.

It has been observed that what influence preparing student-centered activities is the online support and continuous PD sessions that align with introducing new high-tech activities and tools for faculty. On the other hand, faculty 3 argued that *‘watching the recorded lessons though collaborate-ultra made me aware of my teaching routine and allow me to add some more student-centered activities, it’s all about self-reflecting’*. Finally, it has been observed that asking the teachers to do peer-observation and write reflections of their teaching could help them to find out the patterns of their teaching and work on their weakness.

#### **4.4.1.10 Familiarity with the use of technology**

Question number 10 in the questionnaire is ‘How familiar are you with the use of technology?’ Before the remote learning the quarantine, faculty member believed that their expertise level is average. However, after the remote learning and the quarantine, faculty members believed that they are at an advanced level in terms of integrating technology and using BBL. Faculty members became more confident with the use of technology during the pandemic and have gained the ability to use it appropriately. This is mainly because they used the BBL extensively during the past 6 months.

Faculty 1 mentioned that *'I am much more familiar now than at the beginning of online learning! I feel most confident.* Faculty 2 similarly mentioned that *'My level of digital proficiency improved from Average to advance level'.* As a result, one of the advantages of the quarantine is that the faculty member and the students were managing technology and BBL very well by exploring it themselves and discovering some more features within BBL.

#### **4.4.1.11 Using BBL to the Fullest**

In this question 11 which is 'How prepared are you to use BBL to the fullest?' it was observed that the remote learning started suddenly with short notice for the students and the faculty members as well. The faculty members were exposed to various other tools of BBL during the quarantine. The use of the tool was limited to uploading and sharing materials with students and a use grading tools only before the quarantine. Faculty 5 opined that *'I think there are many more aspects/features etc. of BBL that I don't yet know, so I am definitely not using it to its fullest but know much more now than a few months ago.*

Faculty 2 had a differing point of view which is *'Average but could use more support and practice to be more efficient.* Accordingly, it was inferred that the faculty did not use BBL to the fullest but at least they tried a few new BBL features during the quarantine such as Collaborate Ultra. None of the faculty members used the technology to the fullest and it will never happen because the tools are constantly updated, and new ones are added. Therefore, there is always room for development.

#### **4.4.1.12 Factors that Impact Internally**

Question number 12 of the questionnaire is 'What are the factors that impact the utilization of BBL internally?' Faculty expressed that many factors impacted the utilization of BBL internally based on their points of view. For example, faculty 1 assumed that *'the lack of technical experience of the faculty affected the utilization, when the teacher is unaware how to use the tool, then the tool will not be used effectively. Thus, faculty members were in a need of guidance and training'.* On the other hand, faculty 14 claimed that *'Mostly my own knowledge affected my overall experience,*

*if I know how to use more features, I will use this tool much better than if I know limited features’*. Whereas faculty 13 added that *‘Some files exceed the maximum limit allowed to upload, as a result, students will not be able to use it and it won’t be beneficial for them and this is so sad as these are valuable materials’*. All of the faculty members highlighted their own technical knowledge as an internal factor that impacted their practice. Some faculty have an average level, and some have an advanced level of technical knowledge. Based on the level of knowledge the scope of utilization of the tool was impacted.

#### **4.4.1.13 Factors that Impact BBL Internally**

In this question number 13 of the questionnaire which is ‘what are the factors the impact of the utilization of BBL externally?’, it was apparent that the external factors are different than internal factors, but they also affect the utilization of BBL. Faculty 4 stated *‘Students’ internet connection’* to be an external factor that affected the utilization of BBL. 12 more faculty members highlighted the same factor which is *‘Connectivity issue was a big issue with all’*.

Faculty 2 also mentioned that *‘the students do not take the online learning seriously which makes the faculty’s job more challenging. Students do not check their tasks in BBL daily and do not show any readiness for the online learning’*. Hence, the major external factors that influence BBL based on the faculty’s perspectives were the connectivity issues, the student’s readiness, and responsibility in remote learning.

#### **4.4.1.14 Frequently Used Tools and Never Used Tools**

Question number 14 in the questionnaire is ‘what are the tools within BBL you frequently use and what tools you never use? Why?’ Faculty 1 said that *‘The most useful features I used were the announcements, email, assessments, rubrics, content, Studymate, softchalk, respondus, tests which are some digital and educational tools could work easily within BBL. The ones I never used were the discussions boards, and everything else I don’t know about’*. Many features of BBL were not used by faculty members like the BBL calendar, because they didn’t know about it.



Faculty 8, on the other hand, mentioned that *‘the tools I used the most in BBL is Collaborate Ultra to do the virtual teaching with my students and I used rubrics a lot to mark my student’s assignments, the tool I never used is the pooling in the BBL’*. It was observed that the most used tools are announcements, rubrics and Collaborate Ultra. Whereas, the least used tools were calendar and BBL pools. The main reason for the same was the lack of knowledge about all the features of BBL among the faculty members.

#### **4.4.1.15 Most Used Communication Tools in BBL**

Question number 15 in the questionnaire is ‘What type of communication tools in BBL you use the most? Why?’ It was observed that the faculty members are using a few communication tools, such as the BBL announcement. Faculty 2 mentioned that *‘Email and announcements - easy ways to send messages to all students in one go’*. Additionally, Faculty 4 mentioned that *‘Formative evaluation feedback will deliver my feedback to students in one click’*. Faculty 6 mentioned *‘I would rather reach them through their email directly’*.

Most faculty members prefer to reach the students via BBL’s announcements. This feature enables the faculty to send an email to the whole class list or to email specific students enrolled in the course. It is quicker than emailing students via the normal mailbox. On the other hand, another faculty member claimed to prefer to communicate with their students via the assignment's feedback by writing individual comments for the students.

#### **4.4.1.16 Evaluation tools in BBL**

Question number 16 in the questionnaire is ‘what type of evaluation tools do you use in BBL (e.g., assignments, e-portfolio, testing)? Why?’ There are a number of tools that were used by faculty within the BBL. Faculty 4 mentioned that *‘the evaluating tools I usually use are Assignments (with rubrics), tests’* and *‘assignments, e-portfolio, testing to monitor learning and to evaluate the intended learning outcomes’*. In addition, faculty 3 mentioned *‘I am teaching a writing course so*

*what I use the most to evaluate my student's work are Save-and-sign and turn-it-in and they are the most used tools for me within BBL'.*

Based on the 14 responses given by the faculty members in this question, the most used evaluation tool within BBL is the assessment's rubrics and turn-it-in. In addition, the most used tool based on the faculty's perspective in the education division is the e-portfolio where the students create an e-folder contains all their work with videos, pictures, reflections and tasks after the internship or any other practice.

#### **4.4.1.17 Procedures followed to integrate technology**

In this question which is, 'What is the procedure you follow to integrate technology in remote education?' procedures of technology integration varied from a faculty to another. Faculty 14 explained that *'During the online teaching I was using the same PPTs I would've used in class, but had to modify hands-on activities - sometimes this could be done through online discussions or break out rooms, sometimes activities couldn't be modified for online learning and had to be abandoned. I also created Kahoot! Quizzes and Studymate activities- but these were just add-ons as I learned them, as courses I was teaching weren't planned for online.* Whereas, faculty 13 stated that *'I create daily lectures and inform students how to access them.*

The first step the teacher is doing to integrate the technology is exploring the tool or the feature first and followed by introducing the tool for the students and giving the students the chance to explore it. After that, the faculty and the students will be ready to use it in the classroom or in remote learning through a hands-on activity. Effective tools recommended by faculty that can be used within BBL are Kahoot and Studymat.

#### **4.4.1.18 Obstacles while using BBL**

This question is 'What obstacles did you face while using BBL during the quarantine?' The most common obstacle is the internet connection. As faculty 10 mentioned *'Connectivity - students*

*dropping in and out of classes or saying they couldn't hear/see. No alternatives to truly hands-on activities. As well as technical issues with both faculty and students. In addition, 'Student motivation was overwhelming in the first weeks of LFH online'. However, faculty 11 assumed that 'I observed due to lack of social interaction with classmates and the teachers in the physical classrooms, student show a dwindling interest'.*

Hence, students' technical issues appeared again such as the internet connection and another technical issue such as the camera and the audio settings. Another obstacle in online learning remotely was the faculty member's and student's motivation, readiness, and interests. Additionally, the lack of guidance, training, and standard for using technology and BBL were other major hurdles that the faculty faced while using BBL during the quarantine.

#### **4.4.1.19 Overcoming the Obstacles**

In this question which is 'How did you overcome the obstacles you experience during the quarantine?' the faculty members stated that some obstacles have no solution such as connectivity. It is out of hands and nothing can solve this issue. Whereas, some other obstacles can be solved such the technical issues where the students and faculty can solve them with the institution support team.

As explained by faculty 3 *'to overcome the issues I had I needed a lot of patience! I also needed to record my sessions, so students who had troubling joining could view them later. But mostly out of my hands.* On the other hand, faculty 5 claimed that *'As an attempt to solve a technical issue, I contacted online support they are always happy to assist but at that time they were busy with other teachers. So, I could not have the support I needed.* Hence, some obstacles cannot be solved by faculty. It requires IT, specialists, to solve it and training the faculty on how to solve the most common issues is necessary in order to enhance the online learning experience.

#### **4.4.1.20 Other Digital Technologies within BBL**

Question number 20 in the questionnaire is ‘Which other digital technologies do you use to support student’s learning during quarantine?’ There are a number of other digital tools that can be used effectively within BBL such as, Socrative and google classroom. Faculty 1 recommended ‘*Kahoot, Nearpod, Quizlet*’ whereas, faculty 10 suggested ‘*Broadcast, poll everywhere, padlet, prezzi*’.

However, a total of 12 faculty members agreed that the digital tool that was used the most is Kahoot, as it was fun and interactive for the students. On the other hand, some other faculty members were only depending on the BBL features without using any external applications.

#### **4.4.1.21 Further Comments of BBL**

In this question ‘Do you have further comments about the use of BBL during the pandemic of COVID-19?’, faculty 11 explained that BBL during the pandemic is ‘*Very useful to have*’. Whereas, faculty 13 argued that ‘*Due to the sudden start of using BB Learn in an intensive way, the sheer understanding and remembering of all the little details that one needs to take into consideration, was overwhelming. I had issues with connecting from home; I had issues with NOT understanding some of the simple user-friendly "How to" videos that BB Learn has made for us; I had difficulty trying to change the video recordings from non-available to "allow to download" (nightmare); I had difficulty in creating a simple exam because BB Learn can only accept a TXT documents when importing already written exam questions (in Word or pdf) from my files. So rather than a simple drop, I had to first change the document to a new TXT document, then import to BB Learn*’. Also, another faculty reported this ‘*The insane amount of clicking to check a student's grade. The fact that our students avoid using it because it's not as interactive as other LMS systems. The other issue with BB is the amount of details required by the faculty when setting something up...for example, if I don't click one thing I end up compromising an exam or allowing students to download a video of the online class instead of just watch it. We are teachers, not IT people....BB is far too complicated, time-consuming, and extremely stressful*’.

Faculty 11 claimed that they did not get proper training prior to the online teaching and learning in remote learning during quarantine. Lack of faculty training impacted the faculty’s overall

experience. Knowledge is power, and therefore, the faculty members claimed that they should be empowered with the skills that they need to conduct online classes using digital tools. This empowerment ought to be done at the right time before the official integration of the technology. Otherwise, it will be a negative practice for both faculty and students.

#### **4.4.1.22 Further Comments of Technology Integration**

In this question ‘Do you have further comments about the technology integration during the pandemic of COVID-19?’ The faculty was quite positive about the overall experience. As faculty 7 explained ‘*Given the short notice we had, I think it was incredibly successful. We had good support from our IT and Ed Tech departments and there was a lot of PD available.*’ Most of the faculty members had a positive impression about the technology integration and had little to no issues in integrating any beneficial technology in the future.

### **4.5 Summary of the Qualitative Results**

In this part of chapter 4, a total of three themes will summarize the results of the qualitative research in this study. The themes include the faculty views on BBL, faculty readiness and motivation in remote learning, and the obstacles faced in technology integration and BBL. The qualitative results are as follows.

Faculty members found BBL to be an ideal, useful, and effective tool that can be used for remote learning during the COVID-19 quarantine in the UAE. The 14 faculty members agreed that the usability of BBL was beneficial during the quarantine. It was useful because it allowed the faculty members to achieve and meet their teaching objectives. In addition, faculty members were able to carry on the process of teaching and learning successfully regardless of the extenuating circumstances of the COVID-19 pandemic. All the faculty members highlighted the importance of BBL and particularly the use of Collaborate Ultra (CU) in BBL during remote learning. It was an effective tool of virtual teaching and learning as well as an effective distance learning tool. Integrating technology increased the communication among faculty and their students. It enabled the faculty to be facilitators rather than being knowledge provider only.

Faculty members' readiness and motivation level at the beginning of remote learning was average. However, the assistance that the faculty members got from the support team in this institution was sufficient. Besides, the number of professional development programs and training the faculty members were asked to complete to be ready for this shift, enhanced their motivation levels. These two made faculty members motivated and ready for this transition from the traditional way of learning to online distance learning. At the beginning of this pandemic, the faculty members' level of motivation and readiness was average. However, after the intensive training and support, their level developed to an advanced level of readiness and motivation to implement technology and use the BBL more confidently in remote learning.

There are a number of obstacles faced by faculty members during the quarantine using the BBL. Connectivity was a serious concern for all the faculty members during the quarantine. All faculty complained about the internet connectivity. The connectivity issue was a concern for all other universities and schools in the country that were using varied software in remote learning. During this pandemic, all learning systems in the country shifted from a traditional learning system to an online remote learning system using different software. All other software had an issue with the connectivity during this process of technology integration.

Another challenge faced by the faculty was related to the student's readiness. The faculty claimed that some students are not taking this type of learning seriously and some students have "non-professional" behaviors. Students need intensive training the same as the one was prepared for the faculty. This would allow both the faculty members and students to be on the same page. Furthermore, a faculty reported this issue in using BBL and Collaborate Ultra (CU) which is 'difficulty watching all students at the same time and difficulty in controlling cheating during exams and interrupting broadcasts at times'.

Proctoring online is a major challenge even when students have their cameras turned on. Some students find ways to cheat during such sessions. Moreover, students are distracted while implementing the technology and using BBL. Also, student's physical presence is a big question especially in the UAE where we have a conservative society, where the students were not asked to

turn the camera on apart from the final exams. In addition, integrating technology is a time-consuming process.

Several recommendations were given by faculty members. Some of them included creating alternative sources, recording sessions, and allowing for extension of deadlines when students have technical issues, and pointing students to the ICT help desk in order to resolve their issues for the future. It was also recommended to create more engaging content to keep the student's motivated and engaged. Such challenges in BBL can be solved through PD training, practice, trial and error, and persistence. In addition, proper communication and understanding of the culture are required for faculty members. Lastly, some faculty members need to learn how to create student-centered activities within the technology integration.

#### **4.6 Triangulation of Quantitative and Qualitative Data**

In this study, a mixed-methods approach was used to assure the validity of the research findings. The purpose of this step is to compare the data gathered from both data tools, that is, the survey and the questionnaire. These findings were then compared to the literature review to answer the research questions appropriately, endorse proficiency and improve the understanding of this topic. The advantages of triangulation are collecting more data from two different tools, checking the input from a different angle and increasing the validity of the research. Several common themes were observed in the survey and questionnaire as shown in Table 42 below.

| <b>Themes</b>  | <b>Survey</b>  | <b>Questionnaire</b>   | <b>Literature review</b>  |
|--|--|--|---|
| <b>Faculty's Views on the Use of BBL During the Pandemic</b> | BBL is a suitable tool in the UAE                                | BBL is suitable in higher education                                    | From other previous studies, BBL is a suitable tool to use in higher education. |
| <b>Faculty's Readiness and Motivation on IT</b>              | Faculty are ready and motivated to integrate technology and BBL. | Most faculty are ready and motivated; however, some faculty find it an | Faculty's beliefs and motivation impact the overall                             |

|   |  |  |   |
|---|--|--|---|
|   |  | overwhelming experience.   | experience of technology integration and using BBL                          |
| <b>BBL obstacles and best practices</b> | The most common issue is connectivity. | The most common issues are connectivity and student's readiness. | Technology proficiency level and the readiness of both faculty and students |

[**Table 42:** the common themes addressed in survey, questionnaire and LR]

As shown in the table above, it is evident that the findings from both the survey and the questionnaire corroborates with the literature review in terms of the suitability of the use of BBL in remote learning at the higher education level. In terms of the second theme, which is faculty's readiness and motivation, the faculty in the survey has shown a high degree of motivation and readiness whereas in the questionnaire the degree of readiness and motivation was observed to be very low. The faculty found BBL and TI to be an overwhelming practice, as per the results in the questionnaire. In the literature, the faculty member's beliefs were such an important factor to improve the practice and impact the overall experience.

The most common obstacle in the survey is connectivity. Similar findings as also revealed in the questionnaire. However, the readiness of the faculty members and students was also observed to be a common obstacle. In the literature review, the common issue was the level of technical proficiency of both students and faculty members.



## **CHAPTER FIVE: CONCLUSION**

### **5.1 Overview of the Chapter**

The closing chapter in this thesis is chapter five which is the conclusion of this study. In this chapter, a summary of the whole study will be discussed. Additionally, the key findings for the research questions will be addressed along with the strengths, limitations, recommendations, implications, and the scope of further study. Lastly, a concluding note of the study will be highlighted.

### **5.2 Summary of the Study**

The main goal of this study is to gain an insight into the faculty member's experiences and perspectives of technology integration using BBL in higher education in the UAE as well as their practices during the COVID-19 pandemic. An objective was formulated to direct this current study, which is as follows:

The research objective:

To explore the faculty's insight of the technology integration by BBL in higher education, identify the obstacles and best practices the faculty went through during the remote education, and come up with a practical model for the future. This study followed a mixed-methods approach to understand the perspectives of the faculty on TI and BBL and build valid recommendations for the future. In this current study, four questions were prepared to address technology integration using BBL and its influence on faculty member's experiences during the quarantine. Out of the four questions, there was one overarching question and three specific questions.

The main research question is:

How technology integration in higher education is occurring in the UAE? And how do faculty members perceive the usability of BBL?

Specific research questions:

**Research Question 1:** What are the trends and developments accounted for in the literature on technology integration in higher educational institutions in the UAE?

**Research Question 2:** How is BBL used to realize the technology integration in the higher educational institutions in the UAE?

**Research Question 3:** What are the experiences and perspectives of faculty members on the usability of BBL?

As mentioned previously, this study adopted a mixed-methods approach to gain enough data for articulating the answers to the research questions. Two data collection tools were used to collect data – a survey and a questionnaire. The key targeted participant were the faculty members in a higher education institution in the UAE. This institution has 14 campuses across the UAE, all of which have been taken into consideration in this study. The first data tool is a modified survey, it was modified to fit the context of the research. The survey was originally designed by Mundy, Kupczynski, and Kee (2012). The questionnaire was inspired by the survey by changing the questions into open-ended questions to gain further clarification and more in-depth information from the research participants.

The first second and third research questions were quantitative. Thus, they were answered using the quantitative data tool which is the survey. Whereas, the fourth research question was answered by a quantitative data tool which is the questionnaire. All primary findings were assured after the triangulation process.

### **5.3 Key Findings**

In this chapter, after undertaking this study, several research findings reported. Besides, several research implications were highlighted based on the research questions. A significant volume of data was gathered from quantitative and qualitative research tools. The data gathered was categorized and ordered based on the questions of the research.

### 5.3.1 Technology Integration and the Suitability of BBL in Higher Education

To answer the first question of the research, which was ‘How technology integration in higher education occurs in the UAE? And how do faculty members perceive the usability of BBL?’ data was gathered based on the faculty’s ideas, thoughts or experiences. The findings of the question indicated that the faculty’s perception of technology integration through BBL was extremely appropriate. Their perception of BBL was generally positive. It was found that BBL and TI have had a positive impact on their overall experience in remote learning in the UAE during the quarantine period. TI and BBL contributed to the faculty’s and student’s success through the second semester of their learning journey in the academic year of 2020. Nevertheless, some of the faculty members claimed that they were stressed because they were not IT experts and they needed intensive training to catch up with student’s capacities when it comes to technology and digital tools. A comparison between the literature and the empirical study conducted is shown in Table 43 below.

| The key findings from the literature review   | The key findings from the empirical study  |
|---|--|
| Technology integration in higher education is going very well. BBL is a suitable software to be used in higher education. | Technology is integrated extensively in the UAE. However, faculty members argued that there is a necessity for training that is aimed at providing clear standards, policies, and guidelines for both faculty and students. Based on the faculty’s perspective, BBL is a suitable tool to be used in higher education. However, faculty believe that using BBL in totality depends on the course itself. Some courses would function perfectly within BBL and some will not. The faculty claimed that the success depends on the difficulty of the course. This implies that ‘Math’ which is a difficult course would have lower success rates as compared to the management course which is easier. |

**[Table 43: LR findings vs empirical study findings – Suitability of BBL]**

As shown in Table 43 above, based on the empirical study conducted, the findings suggested that technology is used extensively nowadays through BBL during the pandemic. This means that BBL is a suitable teaching and learning tool in higher education. Some other external and internal issues affected the process such as the course difficulty, training for faculty and students, technical issues, and the standards of the technology integration.

### **5.3.2 The Trends and Developments on Technology Integration and BBL in the UAE**

The second question of this research is ‘What are the trends and developments accounted in the literature on technology integration and BBL in higher educational institutions in the UAE?’ Data gathered from the previous related studies were captured in Table 33 below. Faculty members, frequently, integrated a variety of BBL tools such as Collaborate Ultra, Discussion Boards, Rubrics, Announcements, and E-textbooks. The most used features by faculty members within BBL tools were Rubrics and Collaborate Ultra. However, some faculty members, who did not have the necessary technological know-how, used the basics of BBL only such as, uploading materials and marking student’s work. Besides, one faculty member mentioned using the ‘StudyMat’ within BBL. The main trend in technology integration from the literature was the technical issues whereas, the faculty in this current study mentioned internet connectivity issues. Nonetheless, both previous literature and the current study observed that the process of integrating technology is time-consuming. A comparison between the literature and the empirical study conducted is shown in Table 44 below.

| <b>The key findings from the literature review</b>   | <b>The key findings from the empirical study</b>   |
|--|--|
| Most countries spend enormous funds to implement technology in education. All participants agreed that technology integration in education promises lots of benefits as well | The faculty member’s perspective is comparable to the literature review; however, some new findings were also observed. Faculty member’s main trend is the faculty |

|  |   |
|--|---|
| <p>as learning experiences for both students and faculty. In the previous literature, it was corroborated that technology was not implemented and integrated properly, and time was of importance to align it with the expectations. The use of BBL is observed to be disappointing as per previous literature. Users expected better utilization of technology and BBL.</p> <ul style="list-style-type: none"> <li>▪ The main trend is the technical issues the users witnessed during the use of technology and BBL.</li> <li>▪ Preparing course materials online is time-consuming.</li> <li>▪ The features of BBL need to be updated.</li> </ul> | <p>member's readiness and the student's readiness. Besides, the main trend was the connectivity issues.</p> <p>The development suggested by faculty are the following:</p> <ul style="list-style-type: none"> <li>▪ Prepare the faculty members and students before the implementation by offering intensive training.</li> <li>▪ Provide immediate assistance for users when required when they have technical issues or connectivity issues.</li> <li>▪ Educate the students and raise awareness about technology in education and its benefits.</li> <li>▪ Connectivity issues.</li> <li>▪ Technical issues</li> </ul> |
|--|---|

[**Table 44;** LR findings vs empirical study findings – Trends and Development]

As shown in Table 44 above, several trends were found based on the faculty's experiences in this study. The faculty member's readiness, the student's readiness, the connectivity issues, and some technical issues were observed to be some of the common trends. To solve these issues, several suggestions were given like the pre-implementation of technology and the need for training of both the student and the faculty. Providing a manual for common technical issues, so faculty and students know how to handle the technical issues was also recommended. Moreover, it was highlighted that both faculty and students need some tips and tricks to get a better connection.

### 5.3.3 Integrating Technology and the Use of BBL

The third research question was ‘How is BBL used to realize the technology integration in the higher educational institutions in the UAE?’ The BBL was the main source of learning and teaching in higher education in the UAE. All everyday activities and course learning materials were uploaded on the BBL platform. Thus, students can access such resources from the platform at any time and from anywhere. BBL was also used for live streaming and conducting virtual online classes with the students on the daily basis. Lastly, BBL was used as an evaluation tool for assessing the summative and formative assessment. Some faculty added that they can use BBL for advising as well. However, in the literature only two features were discussed, they were uploading materials and submitting assignments. A comparison between the literature and the empirical study conducted is shown in Table 45 below.

| The key findings from the literature review   | The key findings from the empirical study   |
|---|---|
| <ul style="list-style-type: none"><li>▪ In higher education, the common ICT tools that were used are BBL, Zoom, and Moodle.</li><li>▪ BBL was used the most to do the following tasks:<ul style="list-style-type: none"><li>○ Uploading materials</li><li>○ Submitting assignments</li><li>○ Marking student’s work</li></ul></li></ul> | <ul style="list-style-type: none"><li>▪ BBL was used for the following purposes:<ul style="list-style-type: none"><li>○ The main source of learning and teaching</li><li>○ Uploading course materials</li><li>○ Evaluating students work both summative and formative</li><li>○ Virtual classroom</li><li>○ Content source for students and faculty</li><li>○ Live to stream</li><li>○ Advising students.</li><li>○ Online PDs.</li></ul></li></ul> |

[Table 45: LR findings vs empirical study findings – BBL and technology Integration]

As mentioned above in Table 45, the most used tool was BBL and it was used as a primary source of learning and teaching. Faculty members in this study mentioned that BBL was used for much more than just the basic tasks. This included hosting virtual classes, sharing E-textbooks, advising students, attending professional PDs, marking, and sharing summative and formative assessments.

### 5.3.4 Faculty's Experiences and Perspectives within BBL

The last and the fourth research question in this study was ‘What are the experiences and perspectives of faculty members on the usability of BBL?’ The main obstacle reported by the faculty members was their inability to use technology and lack of technical skills. Besides, network connectivity was also highlighted as an area of concern. Furthermore, proctoring an online final exam was challenging as students found ways to cheat. It was difficult to monitor many students through the screen. Online learning and technology were distractions for the students. Students can become inattentive during the online lesson because they can open other websites on their devices. One more issue was the visual contact where the instructors cannot guarantee if the students were on the same page behind the screens. Another challenge was the student's motivation; some students showed a low level of motivation during the online remote learning. A comparison between the literature and the empirical study conducted is shown in Table 46 below.

| The key findings from the literature review  | The key findings from the empirical study   |
|--|---|
| <ul style="list-style-type: none"> <li>▪ Faculty members mostly had a positive experience with BBL. Some faculty reported some issues associated with some of the old features of BBL, or the fact that BBL is consuming time and the technical issues.</li> </ul> | <ul style="list-style-type: none"> <li>▪ Overall utilizing BBL was a positive experience as well. However, the faculty reported many obstacles when using BBL. The issues were:               <ul style="list-style-type: none"> <li>○ Technical issues</li> <li>○ Connectivity</li> <li>○ Proctoring final exams</li> <li>○ Technology is distracting</li> <li>○ Student's motivation</li> <li>○ Students and faculty readiness</li> </ul> </li> </ul> |

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>○ Training and guidance</li> <li>○ Standards and policies</li> </ul> |
|--|---|

[**Table 46;** LR findings vs empirical study findings – Faculty’s experiences within BBL]

As mentioned above in Table 46, this empirical study argued using BBL is a positive experience. However, some faculty members reported some concerns. This empirical study claimed that the main issues were connectivity, technical issues, and proctoring final exams. Online learning can distract the student’s learning as they can open other websites unrelated to the course. Lack of students and faculty’s readiness and lack of the technology standards also made the online learning process challenging.

## 5.4 Implications

Based on the current theoretical, methodological, empirical studies, many contributions were suggested to assist the policymakers and ICT practitioners. The implications for technology integration practice and the use of BBL focused on three many key factors. The first one was the faculty member’s contributions. The second factor was the technical skills and the training for both faculty members and students in higher education. The third and last factor was the motivation and readiness for both faculty members and students in higher education. The main factors are discussed in detail in the following sections:

### 5.4.1 Faculty’s Contributions

From the quantitative and qualitative data analysis, it was clear that the faculty members had a great contribution to make the practice of online learning as successful as they can in higher education. Faculty members tried to solve the student’s technical issues and if they could not solve them, they reported this to the IT support team. The faculty members were available online to address an issue faced by their students. Moreover, they prepared many online workshops to cover the important aspects such as time management during the quarantine and remote learning.



Besides, most of the faculty members completed numerous training hours to provide the best service for their students and be well prepared to use the technology. Faculty's contributions were, therefore, the key to the success of technology integration and the use of BBL in higher education in the UAE during the quarantine period.

#### **5.4.2 Technical Skills and Training**

Another important key element in the practice of remote learning, technology integration, and using BBL is the user's technical skills. This institution was under pressure to enhance the skills of both faculty members and students to enrich their experiences with online learning. The institution offered training and online workshops which were designed to assist them to fix the most common issues they may face, such as setting their audio and the camera in the Collaborate Ultra. This also included general tips for handling technology and working professionally from home. Also, this shift from traditional ways of teaching to online remote learning taught the users to be independent and engage in self-study practices for addressing their concerns. In case they are unable to resolve the issue, they had the option to report the issues to the IT support team for assistance.

#### **5.4.3 Motivation and Readiness**

The last implication is related to the user's readiness and motivation. Two very important factors in technology integration and using digital tools are concerned with being ready and motivated to learn and teach using new techniques and tools. Based on the data gathered from the quantitative data and the qualitative data, most of the faculty members were ready and motivated for online teaching, however, some were not. Thus, their motivation level was low. Besides, some faculty complained about the students lacked readiness and motivation to learn online. They argued that the students did not understand the importance and relevance of remote learning. It is essential for students to learn how to be capable, proactive, responsible, and put effort into their learning. It is also imperative to show willingness and readiness to learn and cooperate with their instructors.

## 5.5 Recommendations

Several recommendations were developed based on the quantitative and qualitative findings of the study. Their recommendations were created for the future implementation and integration of technology in higher education as well as improving the use of BBL in higher learning institutes and universities across the UAE. The following recommendations are valuable for future investigation in technology integration:

1. Increase the total number of participants in both qualitative and quantitative studies. Qualitative studies are typically conducted based on a small scale. However, getting data from a larger sample enhance the representation of the population. Besides, it also allows the researcher to filter and choose valid responses and disregard invalid responses.
2. Adding more questions to both the qualitative questionnaires and quantitative survey to highlight varied correlations between varied scales and more variables in the study is recommended. This is because it would contribute towards gaining more information and a better understanding of the topic.
3. Identifying more demographical data such as the division of the faculty, the remote learning programs offered, the type of training that the faculty received, the educational and technical background of each faculty member would further enhance the study. This would highlight the correlations between nominal and other items in the study as well as to better understand this kind of data and its influence on the overall practice of technology integration.
4. More examinations of the technical soft skills were needed before conducting the official study. Because the users of BBL need to get a clear picture of who is missing what and the kind of skills, they need to avoid the technical issues and avoid facing technical barriers as much as they can. Highlighting the 21st-century skills the students need and work on them to make them well prepared and increase their readiness for online learning is also recommended for enhancing the study.

5. In-depth exploration of how faculty members and students are committed to technology involvement in the process of learning and teaching and how technology influence smart learning and BBL may enhance the study.
6. A further research scope might be in comparing two main variables in the study, for example, the training offered for faculty members and students prior to the integration of technology and then evaluation of their performance.
7. Future research could explore the leadership role of the faculty member with respect to technology integration, including research partners and stakeholders. Thereafter, an evaluation of how leadership styles can influence the technology integration practice and the use of BBL.
8. A more methodological effort is needed on how to capture the influence and consequences of faculty members' individual beliefs and students' involvement in technology integration in the UAE, including further analysis and exploration.
9. It would be very useful to conduct some longer-term studies with faculty members, admin staff and students to analyze all the differences in variables. Additionally, a comparison between the longer-time studies and the shorter-term studies may also be conducted in the future.
10. It would be beneficial to conduct another study based on the schools' level and compare the study with the higher education study to find out the best practices for each level in the UAE.

## **5.6 Strengths and Limitations**

In this part of the existing study, some strengths will be discussed, and many study limitations will be highlighted.

### **5.6.1 Strengths of the Study**

1. Many studies were conducted on the topic of technology integration and BBL. This current study was conducted as an update of the previous investigations done based on TI and the use of BBL in higher education. Additionally, this study was conducted based on an exploration scheme of BBL in higher education in the UAE. The study was supported with a profound literature review, surveys with faculty members, followed by questioners with faculty members. This study reflects practices implemented by the faculty members of the institution in integrating technology and using BBL in remote education during the quarantine.
2. A mixed-methods approach was selected to highlight each side of the study fairly and then triangulate the quantitative data, the qualitative data, and the literature review. Quantitative data gathered from the survey was analyzed using suitable statistical tests. Whereas, the data collected from the qualitative study ‘the questionnaire’ was analyzed via an open-coding procedure by coding the key themes into one category.
3. In summary, the aim of this existing thesis is to explore the faculty’s perspectives of technology integration through the use of BBL in the UAE and the tips that make this practice smoother based on the participant’s responses. These responses gathered from the faculty were very critical to improve the overall practice of technology and achieve the objective of the UAE vision of 2021 of being a smart country.

### **5.6.2 Limitations of the Study**

The limitations of this study are as follows:

1. The data gathered was only from the faculty members without involving any other category such as the students, the admin staff, or other stakeholders of the educational institution. Thus, this study is only reflective of the perception of the faculty members. For a more comprehensive understanding of the impact of TI, it would be better to include all parties

involved in this practice to explain the practice of technology integration and using Blackboard to learn in a better way and give clear insights into their experiences. This study, therefore, lacks a holistic overview.

2. The faculty did not provide detailed responses in the questionnaire even though; they were asked to do so. Some data was brief, and it did not give a clear picture of the situation. Hence, it would be better to include many participants rather than including 14 faculty members and then filter the responses. This would allow the researcher to filter and choose the valid responses and disregard the invalid and short responses. Selecting the detailed ones will ensure that the study is based on high-quality and in-depth information.
3. Including academic programs and each division in this study can add good data sources to compare the faculty member's experiences with technology and their academic programs. This would also facilitate the process of finding out the common concerns between faculty and their majors at the higher education level in the UAE.
4. Sample bias was a limitation in this study, as all participants, 'Faculty members' have strong technological competence which influences them to add a positive contribution about BBL and the utilization of it.

### **5.7 Scope for Further Study**

Many studies were conducted on technology integration and the use of BBL in the UAE, locally and internationally. However, this study may be the first investigation of technology integration and the utilization of BBL during the quarantine brought on with the outbreak of COVID-19. Therefore, this could contribute towards broader research in the UAE regarding technology integration, BBL, remote education, and other digital tools that are or may be used in the educational domain. Future studies can be focused on these topics mentioned below:

1. Instead of involving one higher education institution, future studies can involve several varied higher education institutions and universities in the UAE to compare their practices such as the

UAEU, ZU, and BUID. Besides, there is a scope for conducting a comparative study between the government higher education institutions and the private higher education institutions.

2. Obtaining an in-depth understating of the technical issues the users may have during the online education and the ways by which the use of BBL can save time and effort. Intensive training is imperative for such outcomes. This will support the users i.e., both the faculty members and the students to identify their shortcomings and to start the online remote education without any doubts. In case, they face any, with the training they are capable to fix it and be independent. Future studies can further explore such issues and offer recommendations for addressing them.
3. To include the leaders and other stakeholders of educational institutions is another possibility of future studies. Such groups of people can share information based on their observation of the performance of the teachers and the students during the quarantine period to provide a clear picture of the remote learning practice.

## **5.8 Concluding Note**

This current study was seeking to understand the faculty member's experiences of integrating technology with BBL in selective higher education institutions in the UAE during the COVID-19 quarantine. The expectation before conducting the examination was positive utilization of technology and BBL in remote education in the UAE. Based on the literature, most experiences with technology and BBL were positive.

In this current study, the faculty members in the chosen institution split into two groups, many faculty members were integrating technology and utilizing Blackboard to teach successfully. While the minority of faculty members were unhappy with the experience as they found it stressful. The stress was more prominent when it came to dealing with the technical issues, connectivity, student's readiness and setting standards and rules for technology integration and using BBL.

Data obtained from both the collection tools revealed both positive and negative responses in the survey and the questionnaire. The variation between the faculty member's responses added further

value to this investigation. In conclusion, the overall faculty's practice is indicative of a positive outcome. Such an outcome is likely to contribute to the achievement of the UAE vision of 2021 of being a smart country concerning online education systems.

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## APPENDICES

### Appendix A: Ethics Approved by BUID



#### **Research Ethics Form (Low Risk Research)**

To be completed by the researcher and submitted to the Dean's nominated faculty representative on the Research Ethics Committee

##### **i. Applicants/Researcher's information:**

|                             |                             |
|-----------------------------|-----------------------------|
| Name of Researcher /student | Afra Almansoori             |
| Contact telephone No.       | 056-2226266                 |
| Email address               | 20170171@student.buid.ac.ae |
| Date                        | 24th. Feb.2019              |

##### **ii. Summary of Proposed Research:**

|   |  |
|---|--|
| BRIEF OUTLINE OF PROJECT<br>(100-250 words; this may be attached separately. You may prefer to use the abstract from the original bid): | Attached separately and attached in the appendices of the thesis proposal as well. |
|---|--|

|  |  |
|--|--|
| <p><b>MAIN ETHICAL CONSIDERATION(S) OF THE PROJECT</b></p> <p>(e.g. working with vulnerable adults; children with disabilities; photographs of participants; material that could give offence etc...):</p> | <p>In this current study, the researcher works with adults in the Higher Education level who are faculty members from different campuses in the same institution. No photos will be taken for the participants. Two main tools attached in the appendices will be used in this study for data collection such as, a survey and a questionnaire with the only participants in this study who are the faculty members.</p> <p>There are a number of potential ethical issues in each research method will be used. In the questionnaire, the potential ethical issue may be the dignity of information given from the participants. As some of</p> |
|--|--|

|  |   |
|--|---|
|  | <p>participant's input cannot be certain. In the survey, the potential ethical issue is revealing the identity of the participants during the data analysis. Both research methods can be overstating the benefits of the study in order to attract more participants. Sometime, researchers forget to destroy the tools and instruments used in the study which can cause a serious issues. These issues will be in consideration while conducting this study and will be addressed. Confidentiality of all participants' information will be protected in a safe place. Researcher will not overemphasize the benefits of this study and will give the participants the right to do what they are willing to do. Data gathered will be accessible but coded for transparency matters and to encourage further researches. Participants should be aware of research consent and will be informed about it prior to the involvement of them in the study. They can quit the study at any time and their names will be coded into numbers or codes to protect them. Participants confidentiality will be the secured by hiding their identities, only the research investigators will know the participants identify. Information will be secured and private. Anonymity will be garnered as well, neither the readers nor the researchers will be able to find out the given responses or the respondents identities.</p> |
| <p><b>DURATION OF PROPOSED PROJECT</b> (please provide dates as month/year):</p> | <p>This current study will take place by September 2019 until Jane 2020.</p>  |

|   |                                  |
|---|----------------------------------|
| Date you wish to start Data Collection: | 1 <sup>st</sup> .September. 2019 |
| Date for issue of consent forms:        | June. 2019                       |

### iii. Declaration by the Researcher:

I have read the University's policies for Research and the information contained herein, to the best of my knowledge and belief, accurate.

I am satisfied that I have attempted to identify all risks related to the research that may arise in conducting this research and acknowledge my obligations as researcher and the rights of participants. I am satisfied that members of staff (including myself) working on the project have the appropriate qualifications, experience and facilities to conduct the research set out in the attached document and that I, as researcher take full responsibility for the ethical conduct of the research in accordance with subject-specific and University Research Policy (9.3 Policies and Procedures Manual), as well as any other condition laid down by the BUiD Ethics Committee. I am fully aware of the timelines and content for participant's information and consent. Print name: **Afra Almansoori**

Signature:



Date: 24th.Feb.2019

*If the research is confirmed as not medium or high risk, it is endorsed **HERE** by the Faculty's Research Ethics Committee member (following discussion and clarification of any issues or concerns)\*.....and forwarded to the Research Office to be recorded.*

I confirm that this project fits within the University's Research Policy (9.3 Policies and Procedures Manual) and I approve the proposal on behalf of BUiD's Research Ethics Committee.

Name and signature of nominated Faculty Representative: Professor Abdulai Abukari

Signature: Abdulai Abukari Date: 22.09.2019

Name and signature of Dean of Research: Dr. Khalid Al Marri

Signature: Khalid Al Marri Date: 23.09.2019

iv. If the Faculty's Research Ethics Committee member or the Vice Chancellor considers the research of medium or high risk, it is forwarded to the Research Ethics Officer to follow the higher-level procedures.

*\* If the Faculty representative is the DoS, the form needs the approval of the Chair of the Research Ethics Committee.*

## **Appendix B: Proposal Defence Outcome**

24 September 2019

**Ms Afra Ghareeb Almansoori (Student ID Number 20170171)**

**PO Box 00**

**Dubai, United Arab Emirates**

Dear Ms Almansoori,

### **Subject: Proposal Defense Outcome - Doctor of Education**

I am writing to inform you that the Research Degree Committee (RDC) met to consider and approve the result of your proposal defense. The RDC has reviewed your modified extended research proposal and has decided that you awarded a “pass” (subject to the Academic Advisor’s feedback). The RDC has agreed that you should be allowed to progress to thesis stage. However, the RDC highly encourage you to study the Academic Advisor’s report (when received) and report on how you will deal with it.

Yours sincerely



**Professor Abdullah Alshamsi**

**Vice-Chancellor, Chairman of RDC**

## Appendix C: Permission Letter from BUID

8/25/2020

The British University in Dubai Mail - Ethical form



Christine Salvador <christine.salvador@buid.ac.ae>

---

### Ethical form

**Christine Salvador** <christine.salvador@buid.ac.ae >

Reply-To: christine.salvador@buid.ac.ae

To: Afra Almansoori <20170171@student.buid.ac.ae>

Cc: Solomon.david@buid.ac.ae

Dear Afra

Please be informed that your ethics request has been approved – see attached. It was noted that your DOS will ensure conformity to the stated anonymity and confidentiality.

Regarding proposal defense outcome, I will update you soon. You may now proceed with your data collection. In case you need any support or a letter from BUID that is related to your studies, please contact [sa@buid.ac.ae](mailto:sa@buid.ac.ae). You can click on this link to submit your online request: <http://www.buid.ac.ae/CurrentStudents> and follow-up with SA Team [sa@buid.ac.ae](mailto:sa@buid.ac.ae) directly if it is not received within 2-3 working days.

Good luck with your studies.

Regards,

Christine

**Christine Salvador**

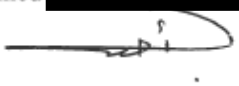
*Research Programmes Officer*

**Student Administration on Department**

The British University in Dubai (BUID)

## Appendix D: Approval from the Institution

### Survey Review Committee Institutional Approval Form

|  |  |
|--|--|
| <b>Investigator:</b>   | Ms Afra Almansoori   |
| <b>Study Title:</b>  | Evaluating the importance of using Blackboard as a tool in learning and teaching with undergraduate students in the UAE from a faculty perspective |
| <b>Requested By:</b>   | British University in Dubai, UAE   |
| <b>Data Collection Method:</b>   | Online survey  |
| <b>Duration:</b>   | 1 month  |
| <b>Responsible Committee:</b> Survey Review Committee  |  |
| <b>Committee's Decision:</b><br>The Survey Review Committee (SRC) reviewed the survey questions for "Evaluating the importance of using Blackboard as a tool in learning and teaching with undergraduate students in the UAE from a faculty perspective".<br><br>After a thorough review of the study materials presented, the Committee members noted no ethical issues for Ms Afra Almansoori to conduct this survey. Hence, SRC approves the study.<br><br><u>Please note that:</u> <ul style="list-style-type: none"><li>- Only questions approved by the SRC are allowed to be used in order to collect the data from the stakeholders. Using a different question without informing the SRC will be considered as violation.</li><li>- [REDACTED] name cannot be mentioned in the research/publications without the senior management approval.</li></ul> <p>[REDACTED] would like to receive copies of publications related to the study in the future.</p> |  |
| <b>Responsible Person:</b><br><b>Name:</b> Dr.Ahmed [REDACTED] Survey Review Committee   |  |
| <b>Signature:</b>  |   |
| <b>Capacity Committee Chairperson</b>  | <b>Date:</b> 11/February/2020  |



Afra Almansoori  
H00085759

## Faculty Survey on Blackboard Learn

My name is Afra Almansoori. I am a doctoral student in the program of Education Management, Leadership and Policy at the British University in Dubai (BUID). I am conducting research entitled 'Evaluating the importance of using Blackboard as a tool in learning and teaching with undergraduate students in the UAE from a faculty perspective'.

Through this survey, I wish to gather your feedback on your experiences in adapting, integrating and effectively utilizing this technology in your daily teaching and learning responsibilities and how you perceived its value in your teaching and learning experiences.

The survey should only take 10 minutes. Your responses will remain completely anonymous. Please ensure that you are reading the survey questions carefully as some of the questions are written in a negative context. Please don't hesitate to provide more feedback and comments about your experience at the end of the survey. All questions are required to be completed.

Thank you for taking part in this evaluation which will provide important and relevant data required for this research. If you have any questions about the survey, please don't hesitate to email the [REDACTED]

| Where do you work?<br>[Drop-down menu] |     | Gender<br>[Drop-down menu] | Total teaching<br>experience<br>[Drop-down menu] |
|--|-----|----------------------------|--|
| ADW                                    |     | Female                     | 0-less than 5 years                              |
| ADM                                    |     | Male                       | 5-less than 10 years                             |
| AAW                                    | AM  |                            | 10-less than 15 years                            |
| AAW                                    | FJW |                            | 15-less than 20 years                            |
| DBW                                    | FJM |                            | 20 years and more                                |
| BBW                                    |     |                            |  |
| SJW                                    |     |                            |  |
| SJM                                    |     |                            |  |
| MZC                                    |     |                            |  |

## Faculty Survey on Blackboard Learn

| <b>SECTION 1: Your Professional Views towards the Use of Blackboard Learn in the Classroom</b>               |                        |               |              |            |                     |
|--|------------------------|---------------|--------------|------------|---------------------|
| <b>Please rate the extent to which you agree with the following statements.</b>                              |                        |               |              |            |                     |
| 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree  |                        |               |              |            |                     |
| <b>Using Blackboard Learn for teaching and learning:</b>   |                        |               |              |            |                     |
|  | Strongly Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly Agree<br>5 |
| 1. Supports faculty in meeting their teaching objectives.  |                        |               |              |            |                     |
| 2. Cannot facilitate faculty collaboration with other faculty.   |                        |               |              |            |                     |
| 3. Enhances faculty interaction with students.   |                        |               |              |            |                     |
| 4. Develops faculty communication skills (e.g., writing feedback and presentation skills).                   |                        |               |              |            |                     |
| 5. Allows faculty to be a learning facilitator instead of an information provider.                           |                        |               |              |            |                     |
| 6. Limits the faculty's choice of instructional materials (e.g., E-text books).                              |                        |               |              |            |                     |
| 7. Provides the faculty with an easy and quick access to instructional materials (e.g., E-text books).       |                        |               |              |            |                     |
| 8. Eases the pressure of preparing teaching materials on the faculty by providing reusable learning content. |                        |               |              |            |                     |
| 9. Cannot accommodate faculty's personal teaching styles.  |                        |               |              |            |                     |
| 10. Motivates faculty to create more engaging student-centred learning activities.                           |                        |               |              |            |                     |
| 11. Enhances the amount of Wi-Fi connection stress.  |                        |               |              |            |                     |
| 12. Makes classroom management more difficult.   |                        |               |              |            |                     |

| <b>SECTION 2: Your Process of Integration</b>  |                 |                        |                     |                           |                        |
|--|-----------------|------------------------|---------------------|---------------------------|------------------------|
| <b>Please indicate the extent to which Blackboard Learn tools are integrated into your teaching practices.</b> |                 |                        |                     |                           |                        |
| 1=Not at all 2= To a small extent 3= To some extent 4= To a moderate extent 5= To a large extent               |                 |                        |                     |                           |                        |
| <b>Blackboard Learn tools enhancing their teaching practices:</b>  |                 |                        |                     |                           |                        |
|  | Not at all<br>1 | To a small extent<br>2 | To some extent<br>3 | To a moderate extent<br>4 | To a large extent<br>5 |
| 1. Digital learning content (e.g., E-text books, tutorials, practices, lesson-plans, slides, course-outline).  |                 |                        |                     |                           |                        |
| 2. Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom).                     |                 |                        |                     |                           |                        |
| 3. Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan).                |                 |                        |                     |                           |                        |
| 4. Analytical tools (e.g., Grade book, student retention centre)   |                 |                        |                     |                           |                        |
| 5. Recreational tools (e.g., games)  |                 |                        |                     |                           |                        |
| 6. Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).                                      |                 |                        |                     |                           |                        |
| 7. Interactive- Audio visual (e.g., YouTube videos, voice recording tools, flip tools)                         |                 |                        |                     |                           |                        |
| 8. Expressive tools (e.g., word processing, on-line journal)   |                 |                        |                     |                           |                        |
| 9. Evaluation tools (e.g., assignments, e-portfolio, testing)  |                 |                        |                     |                           |                        |
| 10. Informative tools (e.g., Web-links)  |                 |                        |                     |                           |                        |

| <b>SECTION 3: Taking into consideration the present conditions which may impact the potential utilization of Blackboard Learn.</b> |                 |                        |                     |                           |                        |
|--|-----------------|------------------------|---------------------|---------------------------|------------------------|
| <b>Please indicate the extent to which Blackboard Learn external factors are challenging.</b>                                      |                 |                        |                     |                           |                        |
| 1=Not at all 2= To a small extent 3= To some extent 4= To a moderate extent 5= To a large extent                                   |                 |                        |                     |                           |                        |
| <b>Viewing on the present conditions:</b>  |                 |                        |                     |                           |                        |
|  | Not at all<br>1 | To a small extent<br>2 | To some extent<br>3 | To a moderate extent<br>4 | To a large extent<br>5 |
|  |                 |                        |                     |                           |                        |

|  |  |  |  |  |  |
|--|--|--|--|--|--|
| 2. Availability of Blackboard Learn support staff. |  |  |  |  |  |
|--|--|--|--|--|--|

**SECTION 4: Your views on the present conditions.**  
**Please rate the extent to which you agree with the following statements.**  
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

**Viewing on the present conditions:**

|  | Strongly Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly Agree<br>5 |
|--|------------------------|---------------|--------------|------------|---------------------|
| 1. Using Blackboard Learn more in the classroom would create a disconnect between the students and the faculty (Less social interaction) |                        |               |              |            |                     |
| 2. Using Blackboard Learn in the classroom takes up too much time.   |                        |               |              |            |                     |
| 3. Blackboard Learn can help faculty develop and adopt new teaching techniques and methodologies.  |                        |               |              |            |                     |
| 4. Blackboard Learn intimidates and threatens faculty.   |                        |               |              |            |                     |
| 5. Using Blackboard Learn allows the faculty to act more as a guide pointing students in the right direction.                            |                        |               |              |            |                     |

**SECTION 5: Your obstacles and best practices in Blackboard Learn.**

1. Did you face obstacles while using Blackboard Learn?  
☐ Yes ☐ No

2. What obstacles did you face while using Blackboard Learn? Please write a detailed answer.  
 [Conditionally visible is #1 is Yes]

3. How did you overcome these obstacles? Please write a detailed answer.  
 [Conditionally visible is #1 is Yes and it appears after #2]

4. What teaching and learning practices do you feel Blackboard Learn is best suited for? Please write a detailed answer.

-Thank you-

## Appendix E: Email to the Dean Office and the institution

Dear Dr. X  
 I hope this email finds you well.

My name is Afra Almansoori and I am a doctoral student in the British University of Dubai (BUID). I am registered in the Education program. At the moment I am conducting a research in technology integration and Blackboard learn in remote education from the faculty members' perspectives. I would like to invite all faculty members to participate in this study. The purpose of this study is to understand the faculty's perspectives on integrating technology through the use of Blackboard Learn and evaluating their experience in order to develop recommendations that can be beneficial for policy makers and specialists in institutions and higher education levels.

Please note that confidentiality of any information is taken. As well as anonymity of institutions and faculty' names, as these considerations are in line with the ethical code of conduct of the British University in Dubai (BUID).

In case you would like to have further information about the study and would like to participate, I will share with you all relevant documents, approval letter, survey questions in a word format, questionnaire in a word format, and lastly both links of the online survey and online questionnaire. Looking forward to hearing from you soon.

Afra Almansoori  
British University in Dubai  
Mob 056-2226266

## **Appendix F: Email to Faculty**

Dear Sir / Madam,

I hope this email finds you well.

My name is Afra Almansoori. I am a doctoral student in the program of Education Management, Leadership and Policy at the British University in Dubai (BUID). I am conducting research entitled **'Technology Integration in Higher Educational Institutions in the UAE: Evaluating the Usability of Blackboard Learn with the Perspectives of the Faculty Members'**.

Through two data collection tools a survey and a questionnaire, I wish to gather your feedback on your experiences in adapting, integrating and effectively utilizing this technology in your daily teaching and learning responsibilities and how you perceived its value in your teaching and learning experiences.

The survey should only take 15 minutes and the questionnaire should take 30 – 40 minutes. Your responses will remain completely anonymous. Please ensure that you are reading the survey questions carefully as some of the questions are written in a negative context. Please don't hesitate to provide more feedback and comments about your experience in the questionnaire. All questions are required to be completed.

Thank you for taking part in this evaluation which will provide important and relevant data required for this research. If you have any questions about the survey, please don't hesitate to email the researcher.

If you are interested to consider, I will send you the link of the survey and questionnaire.

Looking forward to hearing from you.

Regards,

Afra Almansoori

056-2226266

[20170171@student.buid.ac.ae](mailto:20170171@student.buid.ac.ae)

## Appendix G: Data collection instrument – Survey

### Faculty's survey on technology integration and the use of BBL

| Where do you work?<br>[Drop-down menu] |     | Gender<br>[Drop-down menu] | Total teaching experience<br>[Drop-down menu] |
|--|-----|----------------------------|---|
| ADW                                    | RUC | Female                     | 0-less than 5 years                           |
| ADM                                    | RKW | Male                       | 5-less than 10 years                          |
| AAW                                    | RKM |                            | 10-less than 15 years                         |
| AAM                                    | FJW |                            | 15-less than 20 years                         |
| DBM                                    | FJM |                            | 20 years and more                             |
| DBW                                    |     |                            |   |
| SJW                                    |     |                            |   |
| SJM                                    |     |                            |   |
| MZC                                    |     |                            |   |

### SECTION 1: Your Professional Views towards the Use of Blackboard Learn During the Quarantine

Please rate the extent to which you agree with the following statements.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

#### Using Blackboard Learn for teaching and learning:

|  | Strongly Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly Agree<br>5 |
|--|------------------------|---------------|--------------|------------|---------------------|
| 1. Supports faculty in meeting their teaching objectives.      |                        |               |              |            |                     |
| 2. Cannot facilitate faculty collaboration with other faculty. |                        |               |              |            |                     |
| 3. Enhances faculty interaction with students.                 |                        |               |              |            |                     |

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| 4. Develops faculty communication skills (e.g., writing feedback and presentation skills).              |  |  |  |  |  |
| 5. Allows faculty to be a learning facilitator instead of an information provider.                      |  |  |  |  |  |
| 6. Limits the faculty's choice of instructional materials (e.g., E-text books).                         |  |  |  |  |  |
| 7. Provides the faculty with an easy and quick access to instructional materials (e.g., E-text books).  |  |  |  |  |  |
| 8. Eases the pressure of preparing teaching materials on the faculty (e.g., Reusable learning content). |  |  |  |  |  |
| 9. Cannot accommodate faculty's personal teaching styles.   |  |  |  |  |  |
| 10. Motivates faculty to create more engaging student-centered learning activities.                     |  |  |  |  |  |
| 11. Enhances the amount of Wi-Fi connection stress.   |  |  |  |  |  |
| 12. Makes classroom management more difficult.  |  |  |  |  |  |

| SECTION 2: Your Process of Integration  |            |                   |                |                      |                   |
|---|------------|-------------------|----------------|----------------------|-------------------|
| Please indicate the extent to which Blackboard Learn tools are integrated into your teaching practices.<br>1=Not at all 2= To a small extent 3= To some extent 4= To a moderate extent 5= To a large extent |            |                   |                |                      |                   |
| Blackboard Learn tools enhancing their teaching practices:  |            |                   |                |                      |                   |
|   | Not at All | To a small extent | To some extent | To a moderate extent | To a large extent |
|   | 1          | 2                 | 3              | 4                    | 5                 |
| 1. Digital learning content (e.g., E-text books, tutorials, practices, lesson-plans, slides, course-outline).   |            |                   |                |                      |                   |
| 2. Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom).  |            |                   |                |                      |                   |

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| 3. Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan). |  |  |  |  |  |
| 4. Analytical tools (e.g., Grade book, student retention centre)                                |  |  |  |  |  |
| 5. Recreational tools (e.g., games)   |  |  |  |  |  |
| 6. Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).                       |  |  |  |  |  |
| 7. Interactive- Audio visual (e.g., YouTube videos, voice recording tools, filming tools)       |  |  |  |  |  |
| 8. Expressive tools (e.g., word processing, on-line journal)                                    |  |  |  |  |  |
| 9. Evaluation tools (e.g., assignments, e-portfolio, testing)                                   |  |  |  |  |  |
| 10. Informative tools (e.g., Web-links)   |  |  |  |  |  |

**SECTION 3: Taking into consideration the present conditions which may impact the potential utilization of Blackboard Learn.**

**Please indicate the extent to which Blackboard Learn external factors are challenging technically into your teaching practices.**

1=Not at all 2= To a small extent 3= To some extent 4= To a moderate extent 5= To a large extent

**Viewing on the present conditions:**

|   | Not at all<br>1 | To a small<br>extent<br>2 | To some<br>extent<br>3 | To a moderate<br>extent<br>4 | To a large extent<br>5 |
|---|-----------------|---------------------------|------------------------|------------------------------|------------------------|
| 1. Internet connection issues hinder the use of Blackboard Learn (Wi-Fi). |                 |                           |                        |                              |                        |
| 2. Availability of Blackboard Learn support staff.                        |                 |                           |                        |                              |                        |

**SECTION 4: Your views on the present conditions.**

**Please rate the extent to which you agree with the following statements.**

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

**Viewing on the present conditions:**

|  | Strongly<br>Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly<br>Agree<br>5 |
|--|---------------------------|---------------|--------------|------------|------------------------|
| 1. Using Blackboard Learn more in would create a disconnect between the students and the faculty (Less social interaction) |                           |               |              |            |                        |



|   |  |  |  |  |  |
|---|--|--|--|--|--|
| 2. Using Blackboard Learn takes up too much time.   |  |  |  |  |  |
| 3. Blackboard Learn can help faculty develop and adopt new teaching techniques and methodologies.                 |  |  |  |  |  |
| 4. Blackboard Learn intimidates and threatens faculty.  |  |  |  |  |  |
| 5. Using Blackboard Learn allows the faculty to act more as a guide pointing the students in the right direction. |  |  |  |  |  |

#### **SECTION 5: Your obstacles and best practices in Blackboard Learn.**

- Did you face any obstacles while using Blackboard Learn?  

**Yes**
**No**
- What obstacles did you face while using Blackboard Learn? Please write a detailed answer.  
*[Conditionally visible is #1 is Yes]*
- How did you overcome these obstacles? Please write a detailed answer.  
*[Conditionally visible is #1 is Yes and it appears after #2]*
- What teaching and learning practices do you feel Blackboard Learn is best suited for? Please write a detailed answer.

## **Appendix H: Sample of a Survey Completed**

### **Faculty Survey on Blackboard Learn**

| Please rate the extent to which you agree with the following statements.<br>1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree |                           |               |              |            |                        |
|---|---------------------------|---------------|--------------|------------|------------------------|
| Using Blackboard Learn for teaching and learning:   |                           |               |              |            |                        |
|   | Strongly<br>Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly<br>Agree<br>5 |
| 13. Supports faculty in meeting their teaching objectives.  |                           |               |              | *          |                        |
| 14. Cannot facilitate faculty collaboration with other faculty.   |                           | *             |              |            |                        |
| 15. Enhances faculty interaction with students.   |                           |               | *            |            |                        |
| 16. Develops faculty communication skills (e.g., writing feedback and presentation skills).   |                           |               |              | *          |                        |
| 17. Allows faculty to be a learning facilitator instead of an information provider.   |                           |               |              | *          |                        |
| 18. Limits the faculty's choice of instructional materials (e.g., E-text books).  |                           | *             |              |            |                        |
| 19. Provides the faculty with an easy and quick access to instructional materials (e.g., E-text books).                                       |                           |               |              | *          |                        |
| 20. Eases the pressure of preparing teaching materials on the faculty (e.g., Reusable learning content).                                      |                           |               | *            |            |                        |
| 21. Cannot accommodate faculty's personal teaching styles.  |                           |               |              | *          |                        |
| 22. Motivates faculty to create more engaging student-centred learning activities.  |                           |               |              | *          |                        |
| 23. Enhances the amount of Wi-Fi connection stress.   |                           |               | *            |            |                        |
| 24. Makes classroom management more difficult.  |                           | *             |              |            |                        |

## SECTION 2: Your Process of Integration

| Please indicate the extent to which Blackboard Learn tools are integrated into your teaching practices.        |            |                   |                |                      |                   |
|--|------------|-------------------|----------------|----------------------|-------------------|
| 1=Not at all 2= To a small extent 3= To some extent 4= To a moderate extent 5= To a large extent               |            |                   |                |                      |                   |
| Blackboard Learn tools enhancing their teaching practices:   |            |                   |                |                      |                   |
|  | Not at All | To a small extent | To some extent | To a moderate extent | To a large extent |
|  | 1          | 2                 | 3              | 4                    | 5                 |
| 11. Digital learning content (e.g., E-text books, tutorials, practices, lesson-plans, slides, course-outline). |            |                   |                |                      | *                 |
| 12. Communication tools (e.g., Discussion boards, announcements, blogs, virtual classroom).                    |            |                   |                |                      | *                 |
| 13. Organizational tools (e.g., Weekly learning modules, calendar, record keeping, lesson plan).               |            |                   |                |                      | *                 |
| 14. Analytical tools (e.g., Grade book, student retention centre)  |            |                   |                |                      | *                 |
| 15. Recreational tools (e.g., games)   |            |                   |                |                      | *                 |
| 16. Assessments (e.g., Brainstorming, test polls, surveys, save-and-sign).                                     |            |                   |                |                      | *                 |
| 17. Interactive- Audio visual (e.g., YouTube videos, voice recording tools, filming tools)                     |            |                   |                |                      | *                 |
| 18. Expressive tools (e.g., word processing, on-line journal)  |            |                   |                |                      | *                 |
| 19. Evaluation tools (e.g., assignments, e-portfolio, testing)   |            |                   |                |                      | *                 |
| 20. Informative tools (e.g., Web-links)  |            |                   |                |                      | *                 |

| SECTION 3: Taking into consideration the present conditions which may impact the potential utilization of Blackboard Learn.     |              |                     |                  |                        |                     |
|---|--------------|---------------------|------------------|------------------------|---------------------|
| Please indicate the extent to which Blackboard Learn external factors are challenging technically into your teaching practices. |              |                     |                  |                        |                     |
| 1=Not at all 2= To a small extent 3= To some extent 4= To a moderate extent 5= To a large extent                                |              |                     |                  |                        |                     |
| Viewing on the present conditions:  |              |                     |                  |                        |                     |
|   | Not at all 1 | To a small extent 2 | To some extent 3 | To a moderate extent 4 | To a large extent 5 |
| 3. Internet connection issues hinder the use of Blackboard Learn (Wi-Fi).   |              |                     |                  | *                      |                     |

|  |  |  |  |   |  |
|--|--|--|--|---|--|
| 4. Availability of Blackboard Learn support staff. |  |  |  | * |  |
|--|--|--|--|---|--|

| SECTION 4: Your views on the present conditions.  |                        |               |              |            |                     |
|---|------------------------|---------------|--------------|------------|---------------------|
| Please rate the extent to which you agree with the following statements.<br>1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree |                        |               |              |            |                     |
| Viewing on the present conditions:  |                        |               |              |            |                     |
|   | Strongly Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly Agree<br>5 |
| 6. Using Blackboard Learn more in the classroom would create a disconnect between the students and the faculty (Less social interaction)      |                        |               | *            |            |                     |
| 7. Using Blackboard Learn in the classroom takes up too much time.  |                        | *             |              |            |                     |
| 8. Blackboard Learn can help faculty develop and adopt new teaching techniques and methodologies.   |                        |               |              | *          |                     |
| 9. Blackboard Learn intimidates and threatens faculty.  |                        |               |              | *          |                     |
| 10. Using Blackboard Learn allows the faculty to act more as a guide pointing the students in the right direction.                            |                        |               |              | *          |                     |

| SECTION 5: Your obstacles and best practices in Blackboard Learn.  |   |
|--|---|
| 5. Did you face any obstacles while using Blackboard Learn?  | <b>Yes</b> <b>No</b>  |
| 6. What obstacles did you face while using Blackboard Learn? Please write a detailed answer.<br>[Conditionally visible is #1 is Yes]     | Learning curve. Support from staff with PD and applying. Use more advanced functioning. Training students to use it. Changing students understanding of learning towards online. Another obstacle relates to the institution and their limited use of BBlearn they have not embraced the idea of blended or online learning model where this tool could really benefit students and even the school itself. |
| 7. How did you overcome these obstacles? Please write a detailed answer.<br>[Conditionally visible is #1 is Yes and it appears after #2] | Some of the my own personal issues I overcame with my own self learning and training by asking questions of others. To learn more advanced functions I set goals and integrate one or two of these over a semester. There is still things I don't know about BBlearn though which could be taught or introduced by the university.  |
| 8. What teaching and learning practices do you feel Blackboard Learn is best suited for? Please write a detailed answer.                 |   |

Non-traditional teaching models like - blending, online and flipped classroom models. IT can help with students be more responsible for their own learning and also a constructivist and social constructivist approaches.

-Thank you-

## **Appendix I: Data collection instrument – Questionnaire**

### **Technology Integration using Blackboard Learn - Semi structured Qualitative Questionnaire**

#### **1. Number of professional training hours attended in a year**

0 hours

Less than 20 hours

Between 20-40

More than 40 hours

#### **2. Your level of technology proficiency**

Beginner (I am able to perform basic functions in a limited number of computer applications)

Average (I demonstrate a general competency in a number of computer applications).

Advanced (I have acquired the ability to competently use a broad).

**Please give a detailed answer.**

## **SECTION 1: Your views on the use of BBL during the pandemic**

**1. How often do you use Blackboard Learn (BBL) during the quarantine?**

**2. For what purpose do you use Blackboard Learn (BBL)?**

**3. What are your views on BBL's use in remote education and why?**

**4. How, in your view BBL was used during lockdown due to COVID19 in the UAE?**

## **SECTION 2: Your readiness and motivation on technology integration**

**5. What motivates you to create more engaging learning activities using Blackboard Learn (BBL) tools?**

**6. What type of tools in Blackboard Learn motivate the students to learn?**

**7. What supports you to create more student-centered activities?**

**8. How familiar are you with the use of technology?**

**9. How prepared are you to use BBL to the fullest?**

### **SECTION 3: Your role in the process of integration**

**10. What are the factors that impact the utilization of Blackboard Learn (BBL) internally?**

**11. What are the factors the impact the utilization of Blackboard Learn (BBL) externally?**

**12. What are the tools within BBL you frequently use and what tools you never use? Why?**

**13. What type of communication tools in Blackboard Learn (BBL) you use the most? Why?**

**14. What type of evaluation tools do you use in Blackboard Learn (e.g., assignments, e-portfolio, testing)? Why?**

**15. What is the procedure you follow to integrate technology in the remote education?**

### **SECTION 4: Your obstacles and best practices in Blackboard Learn.**

**16. What obstacles did you face while using Blackboard Learn (BBL) during the quarantine?**

**17. How did you overcome the obstacles you experience during the quarantine?**

**18. Which other digital technologies do you use to support student's learning during quarantine?**

**19. Do you have further comments about the use of Blackboard Learn (BBL) during the pandemic of COVID-19?**

**20. Do you have further comments about the technology integration during the pandemic of COVID-19?**

#### **Appendix J: Sample of a Questionnaire completed**

### **Technology Integration using Blackboard Learn - Semi structured Qualitative Questionnaire**

My name is Afra Almansoori. I am a doctoral student in the program of Education Management, Leadership and Policy at the British University in Dubai (BUID). I am conducting research entitled 'Evaluating the suitability of Blackboard as a tool in learning and teaching with undergraduate students in the UAE from a faculty perspective during the quarantine of COVID-19'.

Through this questionnaire, I wish to gather your feedback on your experiences in adapting, integrating and effectively utilizing this technology in your daily teaching and learning responsibilities and how you perceived its value in your teaching and learning experiences during the pandemic of COVID-19.

The questionnaire should only take 10 minutes. Your responses will remain completely anonymous. Please ensure that you are reading the questions carefully. Please don't hesitate to provide more feedback and comments about your experience at the end of the survey. All questions are required to be completed.

Thank you for taking part in this evaluation which will provide important and relevant data required for this research. If you have any questions about the survey, please don't hesitate to email the researcher; [20170171@student.buid.ac.ae](mailto:20170171@student.buid.ac.ae)

#### **Number of professional training hours attended in a year**

0 hours

Less than 20 hours

Between 20-40

**More than 40 hours**

#### **Your level of technology proficiency**

Beginner (I am able to perform basic functions in a limited number of computer applications)

**Average (I demonstrate a general competency in a number of computer applications).**



Advanced (I have acquired the ability to competently use a broad).

**Please give a detailed answer.**

## **SECTION 1: Your views on the use of BBL during the pandemic**

### **1. How often do you use Blackboard Learn (BBL) during the quarantine?**

I used Blackboard learn every day for approximately 8 hours a day. I used it for every class I am teaching and also I used BBL between the classes (during the students' break) to inform my students about any updates in regard with their assessments or projects. I was using the announcements feature extensively as well. Because I find it easier to email the whole class list using Blackboard Learn rather than using the normal ways of emailing.

### **2. For what purpose do you use Blackboard Learn (BBL)?**

I used Blackboard Learn in everything class-related. I have all resources for students there, in weekly folders, assessments, grading, announcements, etc. I also have a hidden folder for instructor resources so the teachers can borrow what they need for their courses. I also met my students on the daily basis through the access of Collaborate ultra for online classes.

### **3. What are your views on BBL's use in remote education and why?**

I used to hate technology and BBL before. But, during the remote teaching I witnessed how technology is important for both teachers and students to carry on the learning and teaching process and meet the students in the daily basis. I was comfortable working from home using BBL to teacher but for other teacher it would have been much more difficult to teach remotely without a solid skills of using technology and BBL. I discovered that Blackboard Learn is well-functioning LMS system. I used it extensively! To access Collaborate, resources, assessments, grades, announcements, etc.

### **4. How, in your view BBL was used during lockdown due to COVID19 in the UAE?**

During the lockdown, Blackboard learn was used to the maximum. I never used as much as this time because this is the only way we can comminute and keep in touch with our students. In addition to that, I did all the PD I was able to complete during the online learning, such as Studymate. All professional development workshop was offered for teaching in Blackboard learn.

## **SECTION 2: Your readiness and motivation on technology integration**

### **5. What motivates you to create more engaging learning activities using Blackboard Learn (BBL) tools?**

Engaging activities within Blackboard learn is different than engaging activities with face to face lessons. Thus, what I do is adding online games at the beginning of the lesson and by the end of the lesson to assure that they are focusing with the lesson. Lots of discussion during the lesson is a must. After all, all teachers need online support and time constraints.

#### **6. What type of tools in Blackboard Lean motivate the students to learn?**

There are a number of tools within the Blackboard that motivates the students to learn, such as the estimation tool and the collaborate ultra where we do virtual online lessons and meet the students face to face and turn the camera on. In addition to that at, Interactive activities, such as Studymate. In addition to that, sharing their views about a certain topic in the discussion board of Blackboard learn. Sometime, we do add extra application to the BBL such as nearpod.

#### **7. What supports you to create more student-centered activities?**

Within BBL, there are a number of student centered activities such as, flipped classroom where the students can act like teachers. Beside, splitting the students into groups to discuss certain topics and then discuss it with the whole class. I like to make activities that I know students will enjoy. They seem to be more comfortable with technology, so I must incorporate this in fun enjoyable (but educational) ways such as, online educational games.

#### **8. How familiar are you with the use of technology?**

I used to use the simple features of Blackboard before such as, marking students' assessments, uploading course materials. But, now I am much more familiar than the beginning of online learning! I feel mostly confident. This confidence was built from the daily exploring in Blackboard lean and the googling some feature of BBL that I don't know about beside the support given from my work to solve the technical issue and giving enormous support.

#### **9. How prepared are you to use BBL to the fullest?**

I think none of us as faculty members were prepared. That shift to online teaching was a sudden decision from the higher management. I think if we were told ahead of time, we will be able to use BBL to the fullest after doing intensive training. There are many more aspects/features etc of BBL that I don't yet know, so I am definitely not using it to its fullest, but know much more now than a few months ago.

### **SECTION 3: Your role in the process of integration**

#### **10. What are the factors that impact the utilization of Blackboard Learn (BBL) internally?**

Many factors can impact the utilization of BBL, but mostly my own knowledge as a teacher, or lack of experience with BBL. Also, some simple issues can appear during the online session such as technical issues that I am unaware how to fix it. Faculty needs to be fully aware of all tools within BBL, how that function and what to do in case of any issues. One more thing that affect the utilization internally is the Wi-Fi and the internet connection. If I have a bad connection that means that my class will be either canceled or delayed.

**11. What are the factors the impact the utilization of Blackboard Learn (BBL) externally?**

Many factors can impact the utilization of BBL, the most important factor is connectivity issues. The second one is the student's readiness and the faculty readiness as well. In addition to that, the prep stage before the implementation can impact the utilization of BBL. Prep is very essential to put everyone in the same page.

**12. What are the tools within BBL you frequently use and what tools you never use? Why?**

The tools that I frequently use are the announcements, the email, the assessments, the rubrics, adding content, Studymate, softchalk, respondus, tests, discussion board, collaborate ultra and recoding the online sessions. The tools I never use can be the pools, some other features that I done know how to use.

**13. What type of communication tools in Blackboard Learn (BBL) you use the most? Why?**

I use various ways to communicate with my students via BBL. The first and fastest way is through the announcements I write an announcement and then it we be automatically emailed to students and alerting them. It is the easiest way to send messages to all students in one go. Also, I add a discussion board and ask a question related to the course and asking them to response to the teacher's question and add comment to two of their classmates in the discussion board. Also, we do virtual online session via Collaborate Ultra.

**14. What type of evaluation tools do you use in Blackboard Learn (e.g., assignments, e-portfolio, testing)? Why?**

The evaluation tools within BBL can be very limited. The only way I can evaluate my students' work and their assignments was using a rubric. Some, time I use the quizzes and tests weekly and those types of assessment can be auto-marked to save the teacher's time and give the students immediate feedback. Also, I use save-and-sign to check their writing.

**15. What is the procedure you follow to integrate technology in the remote education?**

During the online teaching I was using the same PPTs I would've used in class, but had to modify hands on activities - sometimes this could be done through online discussions or break out rooms, sometimes activities couldn't be modified for online learning and had to be abandoned. I also created Kahoot! Quizzes and Studymate activities- but these were just add-ons as I learned them, as courses I was teaching weren't planned for online.

**SECTION 4: Your obstacles and best practices in Blackboard Learn.**

**16. What obstacles did you face while using Blackboard Learn (BBL) during the quarantine?**

The most common issue for most users was the connectivity. Some teachers were unable to continue teaching and some students dropping in and out of classes, or saying they couldn't hear/see. Thus, the online session ended without any proper learning and content delivery. In addition to that, my students were used to do hand-on activities. But, during the remote learning there is no alternatives to truly hands-on activities.

**17. How did you overcome the obstacles you experience during the quarantine?**

A lot of patience! Recording sessions, so students who had troubling joining could view later. But mostly all of the obstacles faced were out of my hands. Also, I always report the issues to the support team at work so, I can received an instant help. Sometimes, I search the issues and google it so I can find a quick issue fixing because I am online and some issues need to be fixed immediately so we can continue the online session.

**18. Which other digital technologies do you use to support student's learning during quarantine?**

I think that we were in a need to come up with additional tools and applications, as the students spent at least 8 hours a day online. So, I used interactive application such as Kahoot, Nearpod, quizlet. I am looking for more to use with my students to make the online learning much more entertaining. Using BBL alone was not fun and was not enough.

**19. Do you have further comments about the use of Blackboard Learn (BBL) during the pandemic of COVID-19?**

Very useful to have especially during the pandemic of COVID-19. That does not mean that the experience was fully smooth, as a teacher I had plenty of ups and downs with BBL, especially during the final exams, invigilating students was a very difficult process but at the end, it was done. Also, when the connection was not good, we all suffer and sometimes we cancel the online session in BBL and replace it with tasks to do through emails.

**20. Do you have further comments about the technology integration during the pandemic of COVID-19?**

Given the short notice we had, I think it was incredibly successful. We had good support from our IT and Ed Tech departments and there was a lot of PD available. However, technology needs a lot of preparation before the implementation, for both faculty and students. COVID-19 was a challenge but it brought out the best of every single person. Since it makes everyone puts extra efforts and extra self-study to move one and carry out the work.

**-The End-**