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Examining Social Perceptiveness and Group Work Effectiveness as  
Factors for E-learning Adoption in Professional Settings: Case of  
MOOCs Users

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## Abstract

The need for e-learning and more specifically MOOCs (Massive Open Online Courses) has been increasing especially after the COVID19 pandemic. Although there have been many studies about them, rare are the ones that look at them in a professional setting since most of the existing literature focuses on e-learning in academia. The current research seeks to investigate this trend by examining the factors that influence MOOC adoption by professionals. A conceptual model was developed by extending the Unified Theory of Acceptance and Use of Technology (UTAUT). A survey along with a test for the respondents' Social Perceptiveness was conducted with 253 questionnaires retrieved for analysis from professionals who had attended MOOCs. The research findings show that users' behavioral intention to attend MOOC is influenced mainly by Effort Expectancy and Facilitating conditions when the emphasis is on Time Flexibility and Continuous availability of these courses. Performance Expectancy and Social Influence specifically were found to have less significant influence on MOOC usage intention. The effect of Social Perceptiveness and Group Work Effectiveness were also analyzed as moderators and results show that Social Perceptiveness has an effect on Social Perceptiveness while Group Work Effectiveness has an effect on Effort Expectancy. The findings help researchers, practitioners and MOOCs designers to reach a better understanding of users' continued intention to use and attend MOOCs. The implications and limitations of this research are also described.

**Keywords:** E-learning, MOOCs, technology adoption, UTAUT, Social Perceptiveness, Group Work Effectiveness

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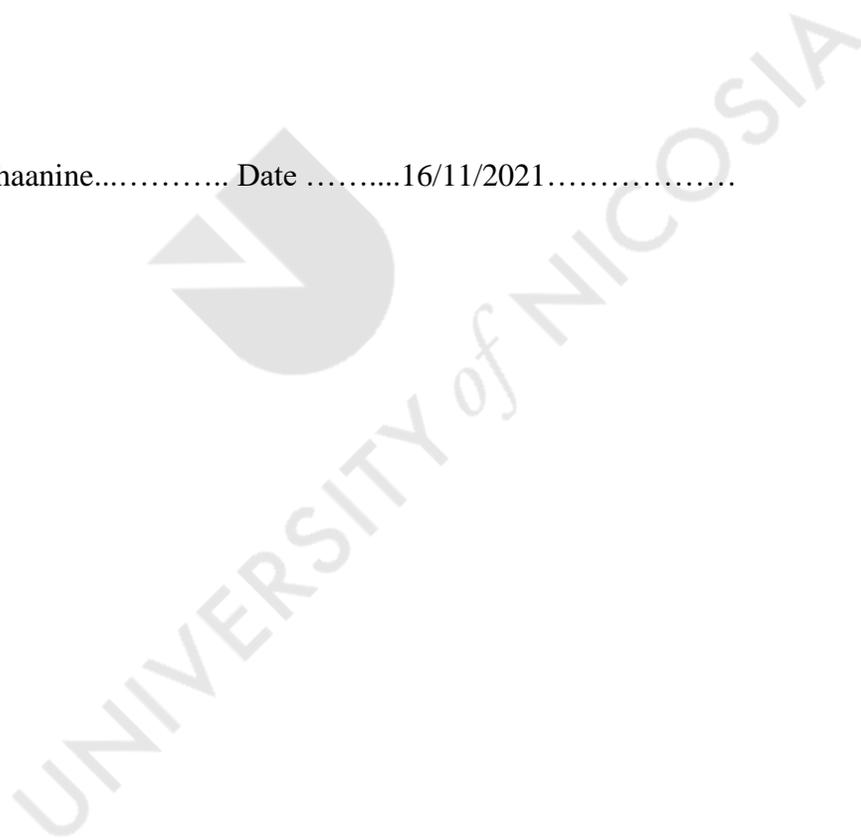
Finally, I would like to thank my family, my mother, father and my brother for believing in me and always being there to support me.



## Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Nicosia. It is a product of original work of my own, unless otherwise mentioned through references, notes, or any other statements.

Signed .....Luciana Chaanine..... Date .....16/11/2021.....



# Table of Contents

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<b>Abstract</b> .....	<b>2</b>
<b>ACKNOWLEDGMENT</b> .....	<b>3</b>
<b>Declaration</b> .....	<b>4</b>
<b>Table of Contents</b> .....	<b>5</b>
<b>Chapter One- Introduction and Background</b> .....	<b>13</b>
1.1 Introduction.....	13
1.2 Statement of the Problem.....	14
1.2.1 Conceptual Definitions .....	14
1.2.2 Exploring the Research Gap and justification .....	16
1.3 Research Aims and Questions .....	18
1.3.1 Significance of the Problem.....	23
1.4 Overview of the Thesis .....	24
1.5 Conclusion .....	25
<b>Chapter Two- Literature Review</b> .....	<b>26</b>
2.1 Introduction.....	26
2.2 E-learning in the Professional Setting.....	26
2.2.1 E-learning definition .....	26
2.2.2 E-learning and Training of professionals.....	28
2.2.3 E-learning and Lifelong learning for professionals .....	31
2.3 E-learning Adoption.....	36
2.3.1 Technology and Professions .....	36
2.3.2 Factors that Influence Technology Acceptance and E-learning Adoption .....	37
2.3.3 Main Theories about Technology Acceptance .....	40
2.4 Learning Theories .....	51

2.4.1 Constructivism Approach .....	51
2.4.2 Connectivism a Learning Theory for the Digital Age .....	52
2.5 Massive Open Online Course (MOOC).....	55
2.6 Social Perceptiveness and Emotional Intelligence (EI) .....	61
2.7 Group Work Effectiveness and Collective Intelligence (CI).....	66
2.7.1 The g Factor .....	67
2.7.2 The c Factor .....	68
2.8 Conceptual Model Based on the Literature Gap.....	77
2.9 Research Hypotheses .....	78
2.9.1 Presentation of the Hypotheses.....	78
2.9.2 Conclusion of the Hypotheses .....	84
2.9.3 Research Question .....	84
2.10 Conclusion .....	86
<b>Chapter Three- Research Methodology.....</b>	<b>87</b>
3.1 Introduction.....	87
3.2 Research Framework and Purpose.....	87
3.3 Philosophical Positioning.....	87
3.4 Research Design.....	94
3.4.1 Research Choice.....	95
3.4.2 Research Strategies .....	96
3.4.3 Justification for the Selection of the Research Method .....	98
3.5 Experiment's Protocol .....	99
<b>3.6 Quantitative Research.....</b>	<b>104</b>
<b>3.7 Survey Design .....</b>	<b>107</b>
<b>3.7.1 Length of Questions .....</b>	<b>108</b>

3.7.2 Design of the Questions .....	108
3.7.3 Grammar and Context .....	109
3.7.4 Double Barreled Questions or statements .....	109
3.7.5 Specificity, Simplicity and Question Order .....	109
3.8 Data Collection .....	109
3.8.1 Secondary Data Collection .....	110
3.8.2 Primary Data Collection.....	110
3.8.3 Sample Size .....	111
3.8.4 Questionnaire .....	112
3.9 Quantitative Data Analysis - Descriptive and inferential statistics .....	116
3.10 Reliability and validity .....	117
3.10.1 Reliability.....	117
3.10.2 Validity.....	117
3.11 Pearson Correlation Analysis .....	118
3.12 Simple Linear Regression.....	119
3.13 Multiple Linear Regression.....	119
3.14 Conclusion .....	119
<b>Chapter Four- Research Findings and Analysis.....</b>	<b>121</b>
4.1 Introduction.....	121
4.2 Descriptive Analysis.....	121
4.3 Reliability Analysis .....	138
4.4 Pearson Correlation Analysis .....	139
4.5 Simple Linear Regression.....	143
4.6 Multiple Linear Regression.....	152
4.7 Moderating Variables.....	155

4.8 Hypotheses Testing.....	157
4.8.1 Testing Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions towards the behavioral intentions of learners to attend MOOCs .....	158
4.8.2 Testing the moderating effect of Group Work Effectiveness on the relationship between Performance Expectancy and Users' Behavioral Intention to attend MOOCs ....	162
4.8.3 Testing the moderating effect of Group Work Effectiveness on the relationship between Effort Expectancy and the Behavioral intention of learners to attend MOOCs ...	166
4.8.4 Testing the moderating effect of Group Work Effectiveness on the on the relationship between Social Influence and the Behavioral intention of learners to attend MOOCs .....	170
4.8.5 Testing the moderating effect of Social Perceptiveness on the relationship between Effort Expectancy and the behavioral intention to attend MOOCs .....	173
4.8.6 Testing the moderation effect of Social Perceptiveness on the relationship between Social influence and the Behavioral Intention to attend MOOCs.....	177
4.9 Conclusion .....	182
<b>Chapter Five- Discussion.....</b>	<b>183</b>
5.1 Introduction.....	183
5.2 Summary of the Findings.....	183
5.3 Interpretations of the results.....	184
5.3.1 Interpretation of the results of Hypothesis 1 .....	184
5.3.2 Interpretation of the Results of Hypothesis 2 .....	187
5.3.3 Interpretation of the Results of Hypothesis 3 .....	188
5.3.4 Interpretation of the Results of Hypothesis 4 .....	189
5.3.5 Interpretation of the Results of Hypothesis 5 .....	190
5.3.6 Interpretation of the Results of Hypothesis 6 .....	191
5.4 Conclusion .....	191
<b>Chapter Six- Conclusions, Limitations Directions for Future Research.....</b>	<b>192</b>
6.1 Introduction.....	192

6.2 Contribution to Research .....	192
6.3 Research Limitations .....	198
6.4 Future Research Directions.....	200
6.5 Conclusion .....	202
<b>References.....</b>	<b>203</b>
<b>Appendices.....</b>	<b>229</b>

## List of Figures

Figure 1 Research Gap.....	18
Figure 2 A model for Using e-learning in Education (Valentina & Nelly, 2015) .....	28
Figure 3 Theory of Reasoned Action; Source: Fishbein an Ajzen (1975).....	41
Figure 4 Theory of Planned Behavior.....	43
Figure 5 UTAUT2 Research Model of Venkatesh, Thong, and Xu (2012) .....	49
Figure 6 The model of Emotional Intelligence on four branches according to (Salovey & Mayer, 1990) .....	63
Figure 7 Conceptual Model .....	78
Figure 8 Developing a research philosophy as a reflexive process. Source Bristow and Saunders (2015).....	89
Figure 9 The research "Onion" taken from (Saunders, Lewis, & Thornhill, 2016) .....	90
Figure 10 Ontology, Epistemology and Methodology: A Directional Dependence (Taken from Hay, 2002:63) .....	92
Figure 11 Research Deductive Reasoning of this Thesis.....	97
Figure 12 Research Inductive Reasoning .....	98
Figure 13 The research onion of this specific research, adapted from Saunders et al. (2007) ...	100
Figure 14 Gender Distribution.....	122
Figure 15 Age Distribution .....	123
Figure 16 Cross-Tabulation between Gender and Years of Experience.....	127

## List of Tables

Table 1 Research Objectives.....	19
Table 2 Research Question, Objectives and Techniques .....	21
Table 3 Table of concepts and references about E-learning in the professional Setting .....	35
Table 4 Concepts and References about UTAUT’s Influential Factors .....	48
Table 5 Unified theory of Acceptance and Use of Technology: Contrasts, Definitions and References .....	49
Table 6 Constructivism .....	52
Table 7 similarities and differences between Connectivism and three major philosophical perspectives.....	55
Table 8 Concepts and References about collective intelligence and Transactive Memory System .....	76
Table 9 UTAUT’s constructs: Definitions, type of scale, number of items in each factor and sources. (Source researcher’s own work) .....	79
Table 10 Formulated Hypotheses to be tested .....	84
Table 11 Main Research Question, Research Objectives, Research Strategies and Techniques	102
Table 12 Operationalization of UTAUT.....	104
Table 13 Statements and Reference to Literature .....	113
Table 14 Age Distribution .....	123
Table 15 Years of Experience in your Profession .....	124
Table 16 Gender-Years of Experience Cross-tabulation .....	124
Table 17 Table of Countries of residence .....	127
Table 18 Mean Median and Standard Deviation .....	128
Table 19 Percentages of each answer .....	130
Table 20 Statements concerning Performance Expectancy (PE).....	131
Table 21 Statements concerning Effort Expectancy (EE) .....	132
Table 22 Statements concerning Social Influence (SI).....	132
Table 23 Statements concerning Facilitating conditions (FC).....	132
Table 24 Statements concerning Fear of Technological Advances .....	133
Table 25 Statements concerning perceived privacy, security and trust .....	133
Table 26 statements concerning Behavioral Intention (BI) .....	134
Table 27 statements concerning User Behavior.....	134
Table 28 statements concerning Social Perceptiveness .....	134
Table 29 Statements concerning Group work Effectiveness .....	135
Table 30 Mean and Standard Deviation for the Textual Description .....	135
Table 31 Mean Median and Standard Deviation for the parameters .....	137
Table 32 Reliability Analysis.....	138
Table 33 Pearson Correlation Coefficients Analysis Results .....	139
Table 34 Collinearity Statistics.....	142
Table 35 Simple linear regression: Performance expectancy/BI-Model Summary.....	143
Table 36 Simple linear regression: Performance expectancy/BI-ANOVA .....	143
Table 37 simple linear regression: Performance expectancy/BI-Coefficients.....	144

Table 38 Simple linear regression: Effort expectancy/BI-Model Summary .....	144
Table 39 Simple linear regression: Effort expectancy/BI-ANOVA .....	145
Table 40 Simple linear regression: Effort Expectancy/BI-Coefficients .....	145
Table 41 Simple linear regression: Social Influence/BI-Model Summary .....	146
Table 42 Simple linear regression: Social Influence/BI- ANOVA .....	146
Table 43 Simple linear regression: Social Influence/BI- Coefficients .....	147
Table 44 Simple linear regression: Facilitating Conditions/BI-Model Summary .....	148
Table 45 Simple linear regression: Facilitating Conditions/BI- ANOVA.....	148
Table 46 Simple linear regression: Facilitating conditions/BI-Coefficients.....	148
Table 47 Simple linear regression: Facilitating Conditions Final/BI-Model Summary .....	149
Table 48 Simple linear regression: Facilitating Conditions Final/BI- ANOVA.....	149
Table 49 Simple linear regression: Facilitating Conditions Final/BI-Coefficients .....	150
Table 50 Simple linear regression: BI/UB-Model Summary .....	150
Table 51 Simple linear regression: BI/UB- ANOVA.....	151
Table 52 Simple linear regression: BI/UB-Coefficients.....	151
Table 53 simple linear regression: FC/UB- Model summary.....	152
Table 54 simple linear regression: FC/UB-ANOVA.....	152
Table 55 Multiple Linear Regression- Model summary.....	153
Table 56 Multiple Linear Regression- ANOVA.....	153
Table 57 Multiple Linear Regression- Coefficients.....	154
Table 58 Group Statistics.....	156
Table 59 Independent Samples Test .....	156
Table 60 R Square result.....	160
Table 61 ANOVA showing the significance of the R Square results.....	160
Table 62 Coefficients.....	161
Table 63 correlation PE, GWE, BI, GWE X PE.....	163
Table 64 Group Work Effectiveness as a moderator, PE/BI-Model summary.....	164
Table 65 Group Work Effectiveness as a moderator, PE/BI-ANOVA .....	165
Table 66 Group Work Effectiveness as a moderator, PE/BI-Coefficients .....	165
Table 67 Group Work Effectiveness, EE, BI and Correlations .....	167
Table 68 Group Work Effectiveness as a moderator, EE/BI-Model Summary.....	167
Table 69 Group Work Effectiveness as a moderator, EE/BI-ANOVA .....	168
Table 70 Group Work Effectiveness as a moderator, EE/BI-Coefficients .....	168
Table 71 Group Work Effectiveness as a moderator, SI, BI and Correlations.....	170
Table 72 Group Work Effectiveness as a moderator, SI/BI-Model Summary .....	171
Table 73 Group Work Effectiveness as a moderator, SI/BI-ANOVA.....	172
Table 74 Group Work Effectiveness as a moderator, SI/BI-Coefficients .....	172
Table 75 Social perceptiveness as a moderator, EE, BI and Correlations.....	174
Table 76 Social Perceptiveness as a moderator, EE/BI-Model Summary.....	175
Table 77 Social Perceptiveness as a moderator, EE/BI-ANOVA .....	175
Table 78 Social Perceptiveness as a moderator, EE/BI-Coefficients .....	176
Table 79 Social Perceptiveness, BI, SI and correlations .....	177
Table 80 Social Perceptiveness as a moderator, SI/BI-Model summary.....	178
Table 81 Social Perceptiveness as a moderator, SI/BI-ANOVA.....	179

Table 82 Social Perceptiveness as a moderator, SI/BI-Coefficients.....	179
Table 83 Grades split according to Age categories-Model Summary .....	180
Table 84 Grades split according to Age categories-ANOVA.....	181



# Chapter One- Introduction and Background

## 1.1 Introduction

The ever-changing and increasingly challenging workplace imposes additional requirements upon employees to update domain knowledge, enhance their skills and competencies and change their attitude towards continuous learning (Martin & Healy, 2006). At the same time, due to financial constraints on businesses (Porter & Lee, 2013), there are increasing pressures that acquisition of new skills should be effective as well as efficient: the goal remains to operate as efficiently as possible, but at the same time, budget and time limitations ought also to be addressed. The need for a continuous process of updating knowledge and skills to stay up to date with the latest advances has, as a result, brought forward e-learning both as a methodological approach and as a pedagogic tool (Qalehsari et al., 2017; Petaloti 2017). One of E-learning's advantages has been its capacity of enabling learners' access to learning and knowledge as well as communication and cooperation through e-learning platforms (Soomro, 2010) through e-learning platforms, and the recent developments with regards to COVID-19 pandemic reinforced the E-learning paradigm (Müller, et al., 2021). In fact, Even before COVID-9 pandemic, E-learning, and through most of the forms it has passed through, has been effective for the advancement of professional skills (Brown, et al., 2006) (Soomro, 2010) in addition to having an important role in addressing business issues such as reducing costs, increasing employee competence and providing greater access to information and accountability for learning (Blocker, 2005). Web-based education, digital learning, interactive learning, computer-assisted teaching and internet-based learning are all known as E-learning (Aljawarneh, 2020) (Yengin, et al., 2011), and with the spread of COVID19, e-learning became one of the best available options (Maatuk, et al., 2021). The market size of e-learning, which was valued at around USD 190 billion in 2018, is estimated to grow at a Compound Annual Growth Rate (CAGR) of 7% till 2025 (Wadhvani & Gankar, 2019). The emerging ever-important role of e-learning and the factors that contribute towards more acceptance of e-learning adoption, especially with Massive Open Online Course (MOOCs) are under investigation in this thesis that will also focus on Connectivism which is a theoretical framework used to understand

learning. In the connectionism model, there is a community of learning, and knowledge is distributed across an information network and is stored in digital formats (Siemens, 2008)

More specifically, the main topic of this research is to examine if social Perceptiveness and Group Work Effectiveness along with extended Facilitating Conditions affect e-learning adoption and MOOCs attendance within the context of professionals. It is worth noting the Facilitating Conditions are factors related to the individual's belief in how much the technical and organizational infrastructure are capable of supporting the use of a certain system. Nowadays, employees do not always have time to attend traditional seminars within standard working hours as flexible, round the clock scheduling becomes common practice. Studies have shown that working shifts have a great effect on employees (Fallahnejad & Mollahoseiny, 2016). According to Brown et al. (2010), shift patterns can lead to fatigue, decrease in motivation and sometimes to reduced productivity since difficult work schedules affect the learning and opportunities for private study. Yet, in today's global work field, the wide job specificity and the great number of specializations even within each profession contributes to diversified mindsets that justify how those people can effectively coordinate and collaborate (Mayo & Woolley, 2016) and one can wonder if social Perceptiveness and Group Work Effectiveness along with extended Facilitating Conditions influence the adoption of e-learning.

## **1.2 Statement of the Problem**

Prior to stating the problem, the researcher will define key concepts related to this thesis.

### **1.2.1 Conceptual Definitions**

#### **E-learning and E-learning adoption**

E-learning as a term, that is, electronic learning, has been used as equivalent to electronic means of education through computers, the Internet or media technologies (Puri, 2012). E-learning popularity continues to increase especially after the COVID19 pandemic which has caused the largest disruption to education systems in human history (Pokhrel & Chhetri, 2021).

E-learning or web-based education is viewed by many scholars as one of the important opportunities that has been provided by the Internet.

With internet adoption, e-learning emerged as a new version of distance learning which is applied via the Internet technologies and involves educational activities that do not require the presence of the teacher and learner at the same time and same place.

### **Social Perceptiveness**

When thinking about means of communication, most people imagine verbal conversation or written discourse; however, there are other ways through which a person can send underlying messages as forms of communication. Social perceptiveness refers to a person's ability to understand the feelings of the people around him/her. It goes beyond spoken communication and involves unspoken communication, understanding body language cues, and identification of the motivation behind behaviors (Kolmar, 2021). Social perceptiveness can be predicted through tests; one of them is the "Theory of Mind" coined by Premack (1978) referring to a hypothetical mental mechanism whereby social agents attribute mental states to each other.

### **Group Work Effectiveness**

The terms teamwork, group work, collaborative work, collective work refer to more than one person collaborating and working together. There is now a large research literature indicating that cooperative and collaborative group work has positive effects on academic and social outcomes (Slavin, et al., 2003).

### **Massive Open Online Courses (MOOCs)**

MOOCs are online courses with the option of free and open registration. According to (McAuley, et al., 2010), these courses build on learners' engagement who self-organize their participation in these courses. The number of Massive Open Online Courses (MOOCs) has increased in recent years, and they have been considered a recent innovation in online learning. According to Wu & Chen (2017), MOOCs have recently been considered as the latest stage of evolution in educational resources that uses the internet with all the differences they show compared to previous approaches in online education.

### **Unified Technology Acceptance and Use of Technology model (UTAUT)**

A large number of theories have been designed over the years especially in the past few decades to investigate behaviors that might have effects on the acceptance of users for technological advances (Lokuge, et al., 2018).

The unified theory of acceptance and use of technology (UTAUT) by Venkatesh et al. (2003) had proven to be a well-recognized model in the field of Information System Acceptance literature and that has high predictability. In fact, The UTAUT model has the collective power of several theories since it integrates eight Information Systems (IS) acceptance theories.

### **1.2.2 Exploring the Research Gap and justification**

E-learning like any other form of technological artifacts can be adopted in various degrees by their intended learners' base. MOOCs as a form of e-learning and despite their popularity, can be challenging to learners with a high percentage of drop-out among those who enroll and attend a course. As such, understanding how to facilitate learners' adoption of MOOCs is very critical to better promote their use. There are several models that study technology acceptance; using E-learning for the purpose of improving effectiveness is a way to upcycle information gathering and learning. However, what if there are factors that facilitate the acceptance and therefore make the e-learning more effective? If such factors can be identified, then understanding why some people attend MOOCs and actually finish the course becomes clearer. Do social perceptiveness and group work effectiveness play a role in this acceptance? And will extending the facilitating conditions that are traditionally used in technology acceptance models prove effective in analyzing these conditions effect? Many studies have targeted e-learning adoption, and some have targeted MOOCs specifically; however, while most of the existing literature focuses on e-learning or MOOCs in academia, this proposed research investigates MOOCs in the professional setting. It will investigate the moderating effects of Social Perceptiveness and Group Work Effectiveness on MOOCs acceptance within a professional setting. It will also examine how certain factors of the UTAUT model, especially the facilitating conditions, can explain how to enhance MOOCs acceptance.

Based on literature review, extensive research focused on adoption and acceptance of e-learning using the acceptance theories, among which the UTAUT model. They also tested the moderating effects of certain variables on the relationships among the behavioral intention to use E-learning and each of the Performance Expectancy, Effort Expectancy, Social Influence and Facilitating

Conditions. While Venkatesh, et al. (2003) started with the moderating effects of age, gender and experience, other scholars attempted to extend the study to include other types of variables. Several tested the effect of culture as a moderator affecting the relationship among the behavioral intention to use a technology and the Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions (Al-Gahtani, et al. (2007); Venkatesh & Zhang (2010); (Yuen, et al. (2010)). Others studied the effects of ethnicity, religion, language... However, and to the researcher knowledge, no studies have attempted to study the moderating effect of Social Perceptiveness and Group Work Effectiveness on E-learning acceptance, specifically MOOCs.

E-learning is posing many challenges because some E-learning systems can promote teaching rather than learning (Rana, et al., 2014) (Ahmed, et al., 2017). Moreover, the development of e-learning models that promote interaction is underlined in the extant literature that also note the need for e-learning to become more effective, and thus make the practical side more efficient (Majumdar, 2017).

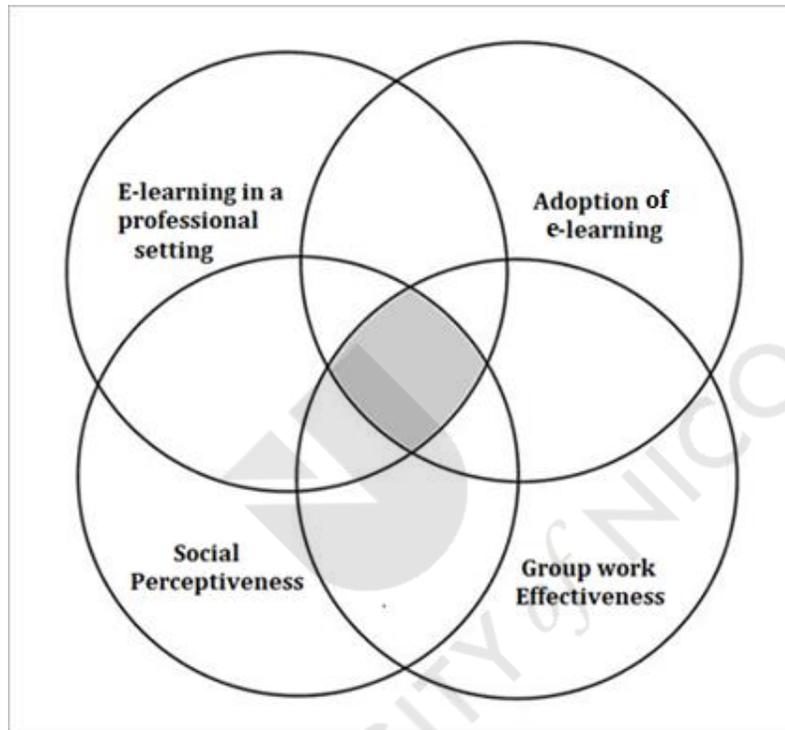
Mehat (2016) and Wolley, Aggarwal and Malone (2015) posit that with the progress the world is witnessing, the skills you have previously acquired might no longer be what an employee needs to succeed tomorrow, regardless of whether if they are what he/she needs to excel today. They also point out that one of the main issues that needs to be addressed is the outdated models and learning styles and to do so, companies can resort to the “digital culture” for competitive advantage in the rapidly changing world. The research gap we are trying to fill is represented in Figure 1, below. It is represented by the area of intersection of the four circles below.

### **Justification**

At the time of writing this report, there are no studies that examine the dynamics within the four intersected areas presented in Figure 1 below. This gap in the literature needs to be substantiated by a literature review. This gap was in fact a motivation for the researcher to further investigate this particular topic through this research. First because e-learning in general and MOOCs in particular have been studied extensively from the point of view of academia and academicians and not enough from the point of view of professionals. In addition to this, finding reasons and recommendations for solutions in an attempt to decrease the high rate of drop-out in MOOCs is of interest. In the next sections we present summaries of the literature review on e-learning, adoption

theories, Social Perceptiveness and Group Work Effectiveness; then we'll present the formulation of the research question that this thesis attempts to answer.

**Figure 1 Research Gap**



### **1.3 Research Aims and Questions**

There have been several research studies that examined the factors that facilitate or hinder the use and acceptance of technology by users. However, few studies focused on e-learning for professionals. And more specifically MOOCs, which have become popular in the last few years; however, recent reports show that the rate of completion among MOOCs users is below 5% (Onah, et al., 2014). A study targeting people who registered and viewed courses by Harvard and MIT on their edX platform has found that the figures have not shown any improvement between 2014 and 2019 (Murray, 2019).

The extremely high dropout rate among users is a central challenge for many corporations and universities that use this form of e-learning.

This research's aim is to explore to what extent Social Perceptiveness and Group Work Effectiveness affect professionals in adopting e-learning, more specifically MOOCs adoption. We will be testing if Social Perceptiveness and Group Work Effectiveness of professionals can assist them in undertaking specific tasks regarding e-learning and predict their acceptance of using MOOCs.

Building on the theoretical foundations of technology acceptance models, especially the UTAUT model, (Fishbein & Ajzen (1975); (Davis (1989); (Ajzen (1991); Thompson, et al. (1991); Moore & Benbasat (1991); Davis, et al. (1992); Taylor & Todd (1995); Compeau, et al. (1999); Venkatesh, et al. (2003)), the research aims to extend the UTAUT model by adding two independent variables as moderators (Social Perceptiveness and Group Work Effectiveness) while extending the already-existing independent variable (Facilitating conditions). The development of such model would be helpful as it can help E-learning and MOOCs designers and implementers to predict and understand the users' behavior and intention to use and adopt a certain technology.

Within this research orientation, the main Research Question emerges:

“To what extent can Social Perceptiveness and Group Work Effectiveness affect the MOOCs adoption among professionals? In other words, how would an adoption model for professionals attending MOOCs taking into consideration Social Perceptiveness and Group Work Effectiveness be like?”

In addressing the main Research Question of the current study, the following Research Objectives are proposed in Table 1 below:

### **Table 1 Research Objectives**

R.O. 1 –Perform an extensive literature review on the relevant cognitive areas of E-learning, continuous education, MOOCs, Social Perceptiveness, Group Work Effectiveness and E-learning adoption theories.

R.O. 2 – Explore indicators related to e-learning and MOOCs adoption with regards to various aspects of Emotional Intelligence and Collective Intelligence, more precisely Social Perceptiveness and Group Work Effectiveness.

R.O. 3 – Frame the methodological processes that will help to address the main research questions that have been listed below.

R.O.4–Perform experiments using an e-learning platform with a group of professionals.

R.O. 5– Design and develop a model based on e-learning adoption with an extension of an already-existing variable (Facilitating conditions) with Social Perceptiveness, Group Work Effectiveness as moderators.

### **Research Questions**

RQ1: To what extent do Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions affect the behavioral intentions of learners to attend MOOCs?

RQ 2: What effect does Social Perceptiveness have on the relationship between Effort Expectancy and Behavioral Intention of learners to attend MOOCs?

RQ 3: What effect does Social Perceptiveness have on the relationship between Social Influence and Behavioral Intention of learners to attend MOOCs?

RQ 4: What effect does Group Work Effectiveness have on the relationship between Performance Expectancy and Behavioral Intention of learners to attend MOOCs?

RQ 5: What effect does Group Work Effectiveness have on the relationship between Effort Expectancy and Behavioral Intention of learners to attend MOOCs?

RQ 6: What effect does Group Work Effectiveness have on the relationship between Social Influence and Behavioral Intention of learners to attend MOOCs?



	<p>of learners to attend MOOCs?  RQ 4: What effect does Group Work Effectiveness have on the relationship between Performance Expectancy and Behavioral Intention of learners to attend MOOCs?  RQ 5: What effect does Group Work Effectiveness have on the relationship between Effort Expectancy and Behavioral Intention of learners to attend MOOCs?  RQ 6: What effect does Group Work Effectiveness have on the relationship between Social Influence and Behavioral Intention of learners to attend MOOCs?</p>	<p>help to address the main research questions that we have listed below.  R.O.4 Perform an experiment on social Perceptiveness with a group of professionals.  R.O.5 Design and develop a model based on e-learning adoption with and extension of an already-existing variable (Facilitating Conditions) and with Social Perceptiveness, Group Work Effectiveness as moderators.</p>	
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The researcher's extended model was proposed after conducting a literature review hereby presented in chapter two and that helped in identifying the variables that can be moderators between the dependent variable (Behavioral Intention (BI)) in this research and the independent variables (Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and the Facilitating Conditions (FC). FC will be further studied as the researcher investigates the effect of Continuous Availability and Time flexibility within the Facilitating Conditions. The extended model has been verified and validated and achieved through:

- Content validity used to measure the coherency among items and since this needs to be tested ahead, a pre-test was performed through a pilot test of the questionnaire prior to the actual distribution process.
- Criterion validity, to ensure validation of the results of hypotheses as it analyzes and assesses the relationship of the tested items within achievable measurements.
- Construct validity as an experimental demonstration that a test is measuring the construct it claims to be measuring.

For the purposes of investigating the research question, answering the derived research questions, and checking if the derived hypotheses are supported, the researcher resorted to a study following quantitative methods. The analysis of the data collected through 253 questionnaires is performed through the Statistical Package for Social Sciences (SPSS) program to check for correlations and regressions between the model variables that are being tested. Add to this, a descriptive analysis was performed to investigate the population in terms of gender, experience, age and location.

### **1.3.1 Significance of the Problem**

Technological developments and the pandemic have accelerated the world's digital transition, increasing the use of online learning and causing a surge in the market for Massive Open Online Courses (Impey, 2020). MOOCs have been used to explore and attain knowledge for both learners and corporate institutions. In fact, MOOCs are used as means of crisis management solutions to make sure education is continuous and not disrupted (Anand Shankar Raja & Kallarakal, 2020). The success of MOOCs is linked to various factors such as quality education, collaboration with reputable universities, videos of lectures, discussion forums have been major reasons for the success of MOOC (Gamage, et al., 2015); however, and like the case of any other technology

innovation, some users have been reluctant to adopt and attend MOOCs, and despite the surge in market for MOOCs, dropout rates are still high. This research attempts to study dominant factors in the adoption of MOOCs, especially among professionals, and this will help in developing future guidelines to enhance the acceptance of MOOCs among potential learners.

## **1.4 Overview of the Thesis**

This thesis is divided into six chapters:

The first chapter of this thesis identifies the research area and states the problem that will be explored throughout the chapters. The researcher starts with the introduction that gives an overview of the central idea and background of the research problem then proceeds to the statement of the problem with a presentation of the conceptual definitions of terminologies and key concepts pertaining to this research.

The researcher then explains the research gap and provides an overview of the research aims and scope and then states the main research question and objectives. Furthermore, the Chapter draws attention to the significance of the research problem and outlines the structure of the thesis.

In the second chapter of the thesis, the researcher focuses on conducting a thorough literature review and provides a detailed review of influential literature. It starts with e-learning in the professional setting where a definition is provided and then two parts are dedicated to positing e-learning within the frame of teaching professionals and lifelong learning.

The second part of chapter two is dedicated to discussing e-learning adoption where the researcher summarizes scholarly work about technology and its influence, how it is rejected and what are the facilitating factors that affect technology adoption by going through some of the main theories that have attempted to explain technology acceptance.

The third part of this chapter is dedicated to understanding MOOCs and what these courses are about and also about learning theories since e-learning and MOOCs have an educational side.

The researcher then discusses social perceptiveness as a part of emotional intelligence and Collective intelligence since it can help to better understand the Group work effectiveness.

In chapter three, the researcher explains the methodological foundation of the research, the specific techniques that were applied to analyze the data whose sources are discussed. The Chapter starts

with a general introduction and a definition of the research nature and purpose. The next step is talking in details about the philosophical positioning. The research choice and the research strategies are then discussed and these are two fundamental elements of the research design. The researcher explains in this chapter the design of the questionnaire, its reliability and validity. The chapter also includes information on how the analysis of the primary data is conducted together with the selection criteria for the statistical analysis software are explained.

In this chapter, the researcher presents the findings along with the quantitative data analysis. A descriptive analysis followed by the reliability and validity analysis in addition to presenting and portraying the results of correlation and multiple linear regression analysis results.

In chapter five, the researcher starts by summarizing the results from the previous chapter and then discusses and interprets these results while linking them to results of previous studies.

Chapter six presents the research conclusions along with key findings and their significance that can be drawn from the results of data analysis. It also mentions all the limitations and obstacles confronting the researcher in due process. Finally, it presents an agenda and includes directions for future research in an attempt to facilitate a greater understanding of the specified research topic.

## **1.5 Conclusion**

Chapter one of this dissertation provides an introduction to the topic that will be discussed throughout the thesis. It includes a statement of the problem along with exploration of the research gap that the researcher attempts to fill.

This chapter also states the research aims and questions and explains the significance of the problem. The chapter ends with an overview of the whole thesis.

## **Chapter Two- Literature Review**

### **2.1 Introduction**

This chapter presents a literature review concerning the main topics that are of interest to this research. After a general introduction, the second part of this chapter tackles e-learning in the professional setting, and it is formed of a definition and two subcategories about positing e-learning within the frame of continuous development of professionals and within lifelong learning.

The third part of the chapter discusses about e-learning adoption, the technology acceptance and its influence, technology and professions, and the main theories that dealt with and have attempted to explain technology acceptance.

Since the research is about e-learning, specifically MOOCs, the fourth part of this chapter is dedicated to learning theories especially the Connectivism theory.

Part five is dedicated to understand MOOCs; what these courses are about, the historical background and the challenges these courses faced.

The researcher then discusses Social Perceptiveness as a part of Emotional Intelligence and Group Work Effectiveness as part of Collective Intelligence.

The chapter ends with two sections. The first about the conceptual model, and the second about the hypotheses and the research question of this research.

### **2.2 E-learning in the Professional Setting**

E-learning has been generally investigated and applied in academia; however, it can also be applied in the professional setting for professional development.

#### **2.2.1 E-learning definition**

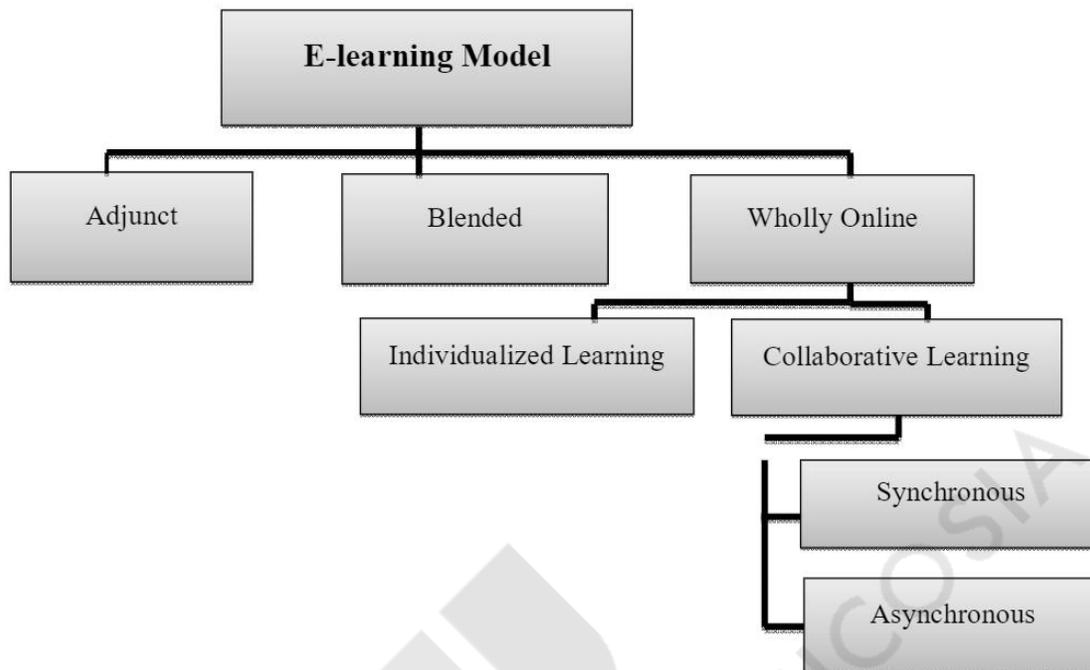
According to Sambrook (2004), e-learning, the abbreviation of electronic learning, can be defined as learning activities that are supported by Information and Communication technology (ICT). Raboca and Carbuorean (2014) explain the term “facilitate” that was used in the definition given by Jenkins and Hanson’s (2003) saying that it refers to the accessibility of receiving the information and increasing interaction whereas the term “support” refers to the infrastructure

(hardware and software). To these scholars, e-learning is an interdisciplinary area with one pillar that originated in technology and the other in pedagogical methods, and both present significant contributions. According to Barton (2019), pedagogy is the theory and practice of learning. As a process, it influences, and is influenced by the development of learners whether the social, political and psychological developments. Taken as an academic discipline, pedagogy studies how knowledge and skills are conveyed in an educational context; it also studies the interactions that take place during learning. Blocker (2005) states that e-learning includes -among others- training, communication, collaboration, knowledge management and performance management.

E-learning (electronic learning) is a style of learning that makes use of the Internet to provide connectivity, accessibility, flexibility, and the capacity to stimulate many types of learning activities (Moore et al.; 2011). It has been regarded as a breakthrough in teaching approaches, not only in the delivery of learning materials but also in the capacities of various learners' competences. This type of online education has become a trend as it is being developed by various institutions throughout the world and is usually increasing in line with advances in communications and information technology and recently the COVID19 pandemic (Snoussi & Radwan, 2020).

There are different forms of E-learning. Valentina & Nelly (2015) proposed a model for Using e-learning in education, and it is presented in the figure below

**Figure 2 A model for Using e-learning in Education (Valentina & Nelly, 2015)**



According to Schneider & Council (2020), ‘E-learning’ means posting the course tools on the internet through the usage of a Learning Management Systems (LMS); Online learning can form a part of an environment of blended learning, where students use it for a part of their class time before moving on to their lecture, class discussion, skills practice or projects.

It is worth noting that there is a difference between Online Learning and Distance Learning and that difference lies in the physical presence of students and faculty members in the same place. In online learning, the instructor can meet the learners in the same place with the use of Online Learning facilities, while in Distance Learning there is total physical separation (Snoussi & Radwan, 2020).

### **2.2.2 E-learning and Training of professionals**

Strother (2002) has discussed the advantages of e-learning in a professional setting and the economic benefits on training in addition to the ability of measuring the participants' reaction and progress.

In general, training is one of the most important activities that help a company secure progress. And e-learning has been identified as one of the training methods with a lot of potential. According to McNelis (2014), the employees in any industry are the greatest asset, and training is necessary to ensure that they remain so. Moreover, Mirvis, Sales and Hackett (1991) emphasize on employees' training. They believe that training increases employees' involvement, and therefore it improves effectiveness, and eventually creates a stronger employment relation at the functional and strategic levels.

Training, time factor and technology implemented, are major factors affecting system success at the workplace (Aggarwal & Prasad, 1998). Furthermore, Shani and Sean (1994) stress on training's importance for a positive employee satisfaction.

According to Serrat (2010), the traditional type of training is no longer the sole most efficient training method. Innovative training is a must because in addition to raising the competency level of the trainees, it also helps them in self-actualization, satisfaction and engagement in besides accountability (Sood, 2016).

According to Farcas & Reininger (2010), it is essential that the learning experience in companies becomes a lifelong learning rather than being limited and sporadic. Here the e-learning concept emerges as an *“effective alternative to broaden the access to education, and to allow life-long learning, by means of a more inclusive system”* (Farcas & Reininger, 2010, p. 18).

McNelis (2014) states that Virtual Learning Environments (VLEs) can provide training anywhere and anytime which makes training easier since it removes logistic barriers that were once considered as challenges. This in turn will have a positive impact on the corporate sector. She explains that the capacity of offering training at a time and place that suits the learner has a positive effect since it will help the learner develop his/her skills.

According to Farcas and Reininger (2010), one of the advantages of e-learning is that it makes it more possible to access information or training. They believe that this is something crucial in order to have a qualified human capital. Moreover, e-learning not only does this, but also eliminates many of the barriers like time, distance, geography. A virtual learning environment has

the advantage of allowing organizations to monitor the progress of their employees' performance on a continual basis, and to identify their training needs; which is crucial in any training program whether traditional or through e-learning (McNelis, 2014).

E-learning cost-savings can sometimes reach the 50% benchmark, when compared to the cost of traditional learning. This is realistically applicable since it will include “*reduced instructor training time, travel costs, labor costs, reduced institutional infrastructure, and the possibility of expanding programs with new educational technologies*” (Ruiz, et al., 2006, p. 209). This is confirmed by Brown, Murphy and Wade (2006), who report that one of the e-learning advantages is addressing issues in business such as reducing costs.

In teaching, Shulman & Shulman (2004) argues that better preparation for teachers is a fundamental factor that will improve the quality and increase the likelihood of a successful educational program. Engaging in the measurement of educational effectiveness creates a value-added process through quality assurance and accreditation review and contributes to building, within the institution, a culture of evidence (Vlasceanu, et al., 2004).

In the education sector for instance, E-learning has been considered as an opportunity to provide larger groups of teachers with educational possibilities (Tomte, 2019). In the healthcare sector, training is also essential and technology and E-learning have made it easier as “*in recent years, medical care has come a long way thanks to technological improvements in diagnostics and treatment. Healthcare providers have developed many new care pathways, improving the organization of care processes*” (Fasanelli, et al., 2017, p. 485). The authors' definition of training in the healthcare domain explain that it is a discipline that deals with the overall health of a population under “educational regimes”. Moreover, according to a report by the World Health Organization (WHO) in 2011, developing and investing in healthcare workforce is an “essential prerequisite for adequate delivery and implementation of public health services and activities” (Marks, et al., 2011).

Many scholars would agree that e-Learning is becoming more mainstream, and in their studies, they attempt to find links to the workplace. According to Blocker (2005), e-Learning can help with some of the most important business issues such as reducing costs, increasing employee's effectiveness and competencies along with providing greater access to information and

accountability for learning. It also has a huge impact on competitive agility and these are just few of its implications for Human Resource Development professions. On the other hand, and according to Schetler (2003), HRD professionals attempt to solve the problems of training by resorting to e-learning and many of them tend to disregard the fact that 50 to 70% of what is learned on the job is usually assimilated informally through content and contact.

Cheese's (2003) identified four areas in which e-Learning could be beneficial when implemented. The first one is retention since research shows a relation between training and retention, and with e-learning, this training is easily accessed by those in need and thus those employees are twice as likely to stay with the company. In his study, Cheese (2003) claims that e-learning also affects employees' attitudes and culture. Based on the analysis of information gathered from more than 60 000 professionals, the author concluded that the majority believed that their skills and knowledge have increased and some of them reported a significant increase in productivity due to training.

### **2.2.3 E-learning and Lifelong learning for professionals**

The significance of life-long learning skills has recently been discussed excessively. When it comes to adult learning, these skills are based on self-motivation, engagement in learning and making full use of a person's resources (Cadorin, et al., 2012). In this context, the authors state that it is important for professionals to *"take responsibility for their profession by being innovative, creative and flexible to change in order to facilitate the adaptation process and encourage responsiveness to change"* (Cadorin, et al., 2012, p. 153).

While confronting advancing automation and aspiring to find and keep their jobs, professionals have several paths to walk through. One of them is stepping up and having the objective of staying broadly informed and creative enough to be part of their organizations' ongoing innovation and strategy efforts (Davenport & Kirby, 2015).

For instance, in the nursing profession, lifelong learning is considered as a necessity. According to the recommendation by the I.O.M. (Institute of Medicine), nurses should be involved with

lifelong learning. Commitment to lifelong learning has become an attractive approach for higher education institutes who now can see the importance of creating capacities for employees in the medical field and becoming involved in lifelong learning. To this end, the accreditation boards, nursing schools, health-related organizations, and instructors should collaborate to provide for a lifelong learning to acquire the qualifications required for the provision of care to different societies. The UNESCO has always been supportive and in favor of lifelong learning. According to the 2019 UNESCO report, one of the goals and policies of UNESCO is to reinforce policies and articles to create a lifelong learning system. Lifelong learning is considered to be an active process used by the learner to search for knowledge and understanding and use them to meet the professional needs (Nayda & Rankin, 2008).

According to Qalehsari, Khaghanizadeh and Ebadi (2017), the result of using lifelong learning strategies among nursing students will be improved quality of education, professional competency of nurses and nursing care outcomes.

However, when it comes to employees, traditional education and training might be difficult because of the working shifts they need to follow. In some cases, employees are required to work night shifts. This will probably affect their willingness to attend a conventional seminar or course. In fact, researchers noted that motivation to learn could suffer as a result of excessive fatigue (Brown, et al., 2010). The authors explain that as a result for hard working days, training and development may be compromised. In their studies, the authors found out that working time arrangements might affect training opportunities and this can even prevent some professionals from becoming competent in the future. E-learning can help in providing these professionals with a platform to get their lifelong education at their convenience without the burden of a rigid schedule that might add to their frustration caused by the pressure of their work requirements and the difficulties of a rotating work shift.

Goodhue & Thompson (1995) suggested a technology-to-performance chain (TPC); this chain is a model that could be used to help the learners and the organization with which they are affiliated; the purpose is to create an understanding and an effective use of information technology. Their study investigates the existence of a positive impact for the information technology on individual performance; however, for this to happen, the technology must be first used and secondly be a good fit with the tasks it supports.

Staples & Seddon (2004) took Goodhue and Thompson's study as a basis for their own study. In their article, the authors tested the Technology-to-Performance in two different settings: voluntary use setting and obligatory use setting. In both, the study showed a strong support to the result that claims that the task-technology positively impact performance and attitudes.

The findings of a study by Brown, et al (2010) highlighted the importance of social support and the sense of team spirit to help professionals cope with their work schedule. A supportive team can be a buffer against the effects of a tiring work schedule and "*team spirit enhance opportunities for learning from colleagues through observation of procedural techniques and management skills*" (Brown, et al., 2010, p. 4).

For lifelong learning to be effective, the curricula need to be revised frequently (DeSilets, 2010). E-learning can help in the professional setting through being a learning tool that helps the health care practitioners with the updated information and knowledge they need. Raboca and Carbuarean (2014) think that flexibility is an important element in e-learning. It allows the learner the freedom to choose and therefore to control his/her learning process. This promotes active participation. The learner will choose the time and place that suit him/her best, for training.

Scholars have studied the Online learning effect in response to the COVID pandemic; they talked about the personal benefits to learners as it can improve not only the physical but also the mental health and well-being (Waller, et al., 2021)

McNelis (2014) reports that e-learning helps in automating tracking and monitoring learners, which is very helpful for administrations as it would lessen their burden.

Furthermore, one of the key advantages of e-learning is its ability to provide the learner with a "*greater freedom and control over the learning process*" (Raboca & Carbuarean , 2014, p. 61). The focus is shifted from teaching to learning and thus the implementation of e-learning programs would be the cause for a shift in the traditional educational paradigm. "*In the e-learning program, learners have more flexibility, opportunity and autonomy to learn at their own pace and time in a highly interactive environment*" (Raboca & Carbuarean , 2014, p. 61).

E-learning outcomes can be easily assessed in order to determine whether learning occurred or not (Ruiz, et al., 2006). The authors believe that an "outcome evaluation" of the changes that the learner undergoes whether 'in knowledge, skills or attitudes' will help measure how effective the

program is. They add that “*evaluating the direct result of an education program by measuring changes in learners’ behaviors, institutional changes, and better patient care is often complex, time-consuming, and costly*” whereas it would be easier to use the e-learning assessment especially when evaluating the curricula of medical schools and healthcare professionals (Ruiz, et al., 2006, p. 210).

Moreover, with e-learning, updating content, online or electronic, is much easier than updating printed content especially in fast-evolving domains such as medicine. Through e-learning the medical practitioners and healthcare employees will have control over “*the content and the learning sequence, pace of learning, time and often, media, which allows them to tailor their experience to meet personal learning objectives*” (Ruiz, et al., 2006, p. 207). Dynamically updating the content of the session, or changing it altogether, is important since it fosters the creation of learning that is aligned with the ever-changing scientific knowledge and training needs of the employees.

E-learning can help transform learning into an individualized or “adaptive learning” which will improve the interaction of the learners among themselves and with others (Ruiz, et al., 2006). Furthermore, Brown, Murphy, and Wade (2006), and when describing the importance of e-learning effect, went to the extent of saying that the “e” in e-learning is not just electronic learning but much more than that, it is ‘enhanced learning’.

Adaptive learning or intelligent tutoring originated with the advent of the artificial intelligence (AI) movement. The aim of using AI is to have the computer or the system adjust the learning program progress to the user’s learning method in order to have a better learning experience. The computer system is thus used as an interactive teaching device. This type of learning takes into consideration the unique needs of each user where the computer would adapt the learning material according to the user’s needs after examining their responses to certain given questions and experiences. Many researchers believe that a learner’s achievement and performance can increase drastically if the learning content is presented in a way that matches the learner’s learning style (Markovic & Jovanovic, 2012).

In almost all fields of professionals, education is not only the transfer of information; it goes beyond that to include also passing on experiences from one employee to another or to a group, and from one generation to another using learning processes that can be as accurate as possible

(Hallin, et al., 2015). Thus education involves acquiring not only theoretical knowledge but also practical skills (Cate & Scheele, 2007), (Weeger & Farin, 2016).

E-learning in the professional domain is presented as a way that can provide unlimited access to up-to-date information from all over the world. It is also a way to make the learning process faster and the learning methods more optimized (But, et al., 2020).

Knowledge and human skills today have a shorter span of life more than ever; this creates an increasing pressure for the professionals to remain up-to-date and at the forefront of education and training throughout their whole career. Being in the center of globalization and technological advances, university degrees are just the beginning of years of continuing education. Life-long learning that was considered merely a buzzword is quickly becoming an imperative (Urduan & Weggen, 2000).

A summary of some of the relevant literature is presented in table 3 below:

**Table 3 Table of concepts and some of the references about E-learning in the professional Setting**

<b>Concept: E-learning in the Professional Setting</b>	<b>References</b>
<b>E-learning and Training of professionals</b>	(Mirvis, et al., 1991) , (Shani & Sean, 1994), (Aggarwal & Prasad, 1998), (Strother, 2002), (Schetler, 2003), (Cheese, 2003), (Shulman & Shulman, 2004) (Vlasceanu, et al., 2004), (Blocker, 2005) (Ruiz, et al., 2006), (Brown, et al., 2006), (Serrat, 2010), (Farcas & Reininger, 2010), (Marks, et al., 2011), (McNelis, 2014), (Sood, 2016), (Fasanelli, et al., 2017), (Tomte, 2019).

<p><b>E-learning and Lifelong learning for professionals</b></p>	<p>(Ruiz, et al., 2006), (Brown, et al., 2006), (Brown, et al., 2010, p. 4), (DeSilets, 2010), (Markovic &amp; Jovanovic, 2012) (Raboca &amp; Carbuarean , 2014), (McNelis, 2014), (Urdan &amp; Weggen, 2000), (Hallin, et al., 2015), (Cate &amp; Scheele, 2007), (Weeger &amp; Farin, 2016). (But, et al., 2020).</p>
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**2.3 E-learning Adoption**

**2.3.1 Technology and Professions**

Technology has been constantly evolving, and so has been the internet. Combining these two and using them in the most effective and efficient ways can really be helpful in many areas of our everyday life, especially in certain professions, and more importantly in e-learning for professionals. Small devices that can be carried around, connectivity and internet availability everywhere have made things easier.

The ever-evolving professional fields involve nonstop professional development of workers in terms of both knowledge and skills; subjecting these domains to facing many problems that need to be addressed in order to guarantee efficiency. Thus the need of resorting to other fields such as technology and innovation, economics...etc. to help in the sustainability of a certain industry.

Traditional learning concepts are constantly replaced by new ones such as e-learning, telemedicine (or the remote diagnosis and treatment of patients by means of telecommunications technology) or virtual client or a client virtualization which is a virtual machine (VM) environment in the user's machine. Many scholars believe that these new methods are needed as old methods often present minimum interaction (But, et al., 2020). Of course these new concepts come to support the traditional concepts and not to totally replace them because new is not always better (Cook, et al., 2005).

### **2.3.2 Factors that Influence Technology Acceptance and E-learning Adoption**

Studies have shown that some of the learners who enroll in e-learning courses do not necessarily complete them successfully (Dutton & Perry, 2002) (Murray, 2019).

Brown, Murphy, & Wade (2006) believe that for some people, e-learning programs are not efficient as training programs due to “*motivational issues and interruptions*”. They believe that some people, when left to control or manage their own learning process, would lack the personal motivation. The researchers’ findings also consider that the “*lack of the immediate response to questions and trainer interactions*” can be a disadvantage. This is confirmed by research that shows that some students who start learning these courses do not finish them (Dutton & Perry, 2002) (Onah, et al., 2014) (Murray, 2019). .

When it comes to attitudes towards web-based technology, previous studies have found that perceived ease of use and perceived usefulness were mediating constructs (Strother, 2002); (Yucel, 2006). Researchers have been looking at other factors that might also influence technology acceptance and adoption of e-learning and web-based technology in different industries.

#### **Subjective Norm (SN)**

Many studies have investigated the relationship between social norms and behavior (Tornatsky & Klein, 1982); (Venkatesh & David, 2000); some discussed the fact that social pressure can affect individuals’ behaviors. This can be the case in technology acceptance. For instance, if the employee is from a collective culture, he/she might be using technology out of pressure from his/her peers or superiors. This factor was dropped later on from the TAM model; however, other scholars found its effect is influential on perceived usefulness (Lee, 2006). This factor was found to have a predictive effect on the satisfaction of learners (Gunawardena & Zittle, 1997) and on their motivation enhanced by social factors (Frith, 2002). This comes in line with Kim, et al. (2005) results who suggested that a learner’s satisfaction and motivation for e-learning are influenced by subjective norm.

#### **Internet Experience**

Previous research has shown that an individuals' prior experience is a main factor in his/her acceptance of IT. According to Agarwal and Prasad (1999), prior experiences is a strong influencer on the intention to use of a specific system through perceived ease of use. O'Cass and Fenech (2003) stress that users of the internet, and after having gathered enough experience through adopting computer technology, will create a belief that they can use the internet for learning purposes too. In fact, the experience with computerized technology of that individual directly and indirectly affects his/ her computer usage behavior through perceived usefulness and perceived ease of use (Igbaria, et al., 1995). These scholars believe that a person's past experience is one of the factors that explains the differences in technology acceptance from a person to another. Finally, Conrad (2002) found that anxiety about e-learning decreases when experience in using e-learning increases. This finding is supported by the recent study of (Elshami, et al., 2021)

### **System Interactivity SI**

According to Palloff and Pratt (1999), interaction among learners/students themselves, their interaction with their instructors and the collaboration in learning that results from these interactions are key elements in the learning processes. Thus the availability of tools such as discussion forums, chat applications, e-mails...etc. that facilitate these interactions is essential. Research differentiated between synchronous and asynchronous learning and training. Synchronous learning is the learning that happens at the same time for the instructor and the learners where the interaction between them would be real-time interaction, whereas in asynchronous learning, the instructor and the learners are not engaged in the learning process at the same time; thus, there is no time and space constraint for any of the parties. According to Duffy *et al.* (1998), this type of asynchronous learning environments are helpful as they reinforce critical thinking and information processing since they give the learner time to process their thinking when they post a message online. This is supported by the findings of (Kochtanek & Hein, 2000). It is a way to develop a richer and more in-depth interactions among the different parties and can also facilitate case studies (Bonk & Cunningham, 1998). According to Alhabshi (2002), a web-based learning environment should combine both synchronous and asynchronous communication to support various elements.

### **Self-efficacy (SE)**

It is a person's personal belief about their abilities to successfully perform certain tasks, and Self-efficacy is reported to be one of the important beliefs in the social learning theory (Bandura, 1986); (Bandura, 1997). In fact several studies found that it can influence decisions about behaviors that should be undertaken (Bandura, 1997); (Brown & Inouye, 1978). Compeau and Higgins (1995) claim that computer self-efficacy is a significant determinant of behavioral intention to use information technology. Moreover, Lim (2000) believes that using computer self-efficacy is useful when it comes to predicting learners' future participation in web-based distance education. Thereby. When it comes to e-learning, self-efficacy can be defined as an individual's self-confidence in his/her ability to undertake a learning task using an e-learning system. Thus, the higher is a learner's sense of self efficacy, the more they believe they can use an e-learning system. The finding is also supported by the results of the study conducted about the influence of general self-efficacy on the interpretation of information within online learning (Wilde & Hsu, 2019).

### **Technical Support (TS)**

According to Ralph (1991), technical support pertains to the assistance of users who are using software and hardware products. This can include a wide variety of facilities such as hotlines, online support services, remote control software... etc. Technical support is an important factor not only in users' satisfaction (Mirani & King, 1994), but also in technology acceptance for teaching (Hofmann, 2002); (Williams, 2002). Many scholars believe some e-learning courses failed in achieving their goals, mainly because the learners did not have access to technical advice and support (Alexander & McKenzie, 1998); (Soong, et al., 2001).

Add to the above, reinforced learning is a reason for e-learning adoption. Some scholars state that it is crucial to periodically reinforce learning or else it would become shallower and eventually, it will be lost in the individual whose learning has not been reinforced (Ornos, 2011). Moreover, a learner's performance is positively affected when his/her learning preferences match the instructor's style of teaching or training (Harb & El Shaarawi, 2006).

Learners differ from each other because of their level of prior knowledge and their existing competences, in addition to other factors (Surjono, 2011). Thus, they adopt e-learning differently.

### **2.3.3 Main Theories about Technology Acceptance**

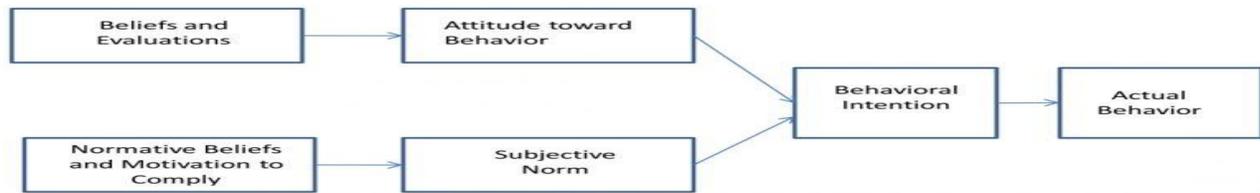
Several theories have been used to try to explain technology acceptance; investigating the literature of technology acceptance in the healthcare domain has shown that the focus is mainly on three theories. In an attempt to ground our study in the proper theory, below is a historical overview of these theories, how they developed and some of the factors affecting the success of technology implementation. Historically, these theories evolved as follows: first the Theory of Reasoned Action, followed by the Theory of Planned Behavior and then came the Technology Acceptance Model that was later on adjusted in the developed model.

#### **2.2.3.1 The Theory of Reasoned Action**

First developed in 1975 by Fishbein and Ajzen, The Theory of Reasoned Action (TRA)'s focus was on the behavioral intention model which is a model that has evolved from social psychology. The main purpose of TRA is to understand an individual's behavior by looking at his/her motivation to perform an action. According to this theory, an individual's intention to perform a behavior is the main predictor of whether or not they will actually do this behavior. It postulates that the intention precedes the behavior known as behavioral intention, and it comes as the result of believing that by exerting a certain behavior, a specific outcome will be reached. Its main claim is that the behavior of an individual is an important determinant in any decision taken. The theory suggests that the stronger the intentions are, the more the effort to perform the behavior will be, and thus the performance of the behavior will be more likely to happen. According to this theory, an individual's behavior is based on rationality which in turn is based on rational analysis, individuals whereby will assess information in a systematic manner.

As shown in Figure 2 below, TRA starts with "beliefs and evaluations" as two main variables that lead to "attitude toward behavior; "Normative beliefs and Motivation to Comply" lead to "Subjective Norms". Both the "Attitude toward Behavior and "Subjective norm" lead to the Behavioral Intention which in turns will explain an individual's Actual Behavior.

**Figure 3 Theory of Reasoned Action; Source: Fishbein and Ajzen (1975)**



According to TRA, the behavior should be clearly defined in terms of action, target, context, and time. So, if we go backward in this figure, it can be concluded that a behavior's main motivator is the behavioral intention whose two main determinants are attitude and norms. This means that by examining attitudes and subjective norms, researchers can have an idea of whether or not an individual will perform the intended action.

When it comes to attitudes, key determinants of behavioral intention, are beliefs and evaluations. Beliefs regarding the outcomes of the performed behavior and how probable it is, whereas evaluation is about whether or not the outcomes would be positive.

The theory stipulates that there is a correlation between attitudes and outcomes, in the sense that if a person believes that the outcome of a certain behavior will be favorable, then he/she is more likely to have a positive attitude towards that behavior.

Subjective norms are also one of the key determinants of behavioral intention. They refer to the way perceptions of relevant groups or individuals such as family members, friends, and peers can affect one's enactment of the behavior (Fishbein, 1967). According to Ajzen & Albarracin (2007), subjective norms are defined as the perceived social pressure to perform or not perform the behavior. Subjective norms are the results of Normative beliefs and motivation to comply.

Normative beliefs are about whether or not referent groups approve of the action: the more likely the referent groups will approve of the action, the more likely the individual is inclined to perform the act (Montano & Kasprzyk, 2008). Whereas motivation to comply addresses the fact that individuals may or may not comply with the prescribed social norms of the referent groups (Montano & Kasprzyk, 2008).

As for the behavioral intention, it is a function of both attitudes and subjective norms toward that behavior.

The TRA can be expressed into the below formula:

$$BI = (AB) W1 + (SN) W2$$

BI is the Behavioral Intention

AB is the attitude toward performing certain behavior

W is the derived weights

SN is the subjective norm related to performing the behavior

### Scope and Limitations of the Theory of Reasoned Action

The TRA scope is very wide. Although this theory was developed first within the health field to understand healthcare providers' behaviors, its theorists, Fishbein and Ajzen, asserted that this theory can be applied in any context to understand and predict any human behavior (Fishbein & Ajzen, 1975). Other scholars also stated that behavioral intention can predict the performance of *"any voluntary act, unless intent changes prior to the performance or unless the intention measure does not correspond to the behavioral criterion in terms of action, target, context, time-frame and/or specificity"* (Sheppard, et al., 1988, p. 325).

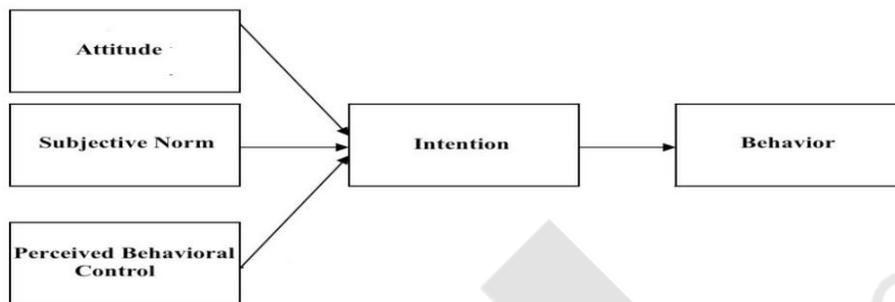
Scholars criticized this theory mainly on two main dimensions. The first criticism came from Ajzen (1985) who stated that the theory suffers from correspondence factors. This means that the theory cannot predict behavior, intention, and attitude, unless it is linked with context and time. The second criticism was that the theory applies to volitional behavior, which is defined as *"a behavior already been thought out beforehand in a person's conscious"* (Yousafzai, et al., 2010, p. 1179).

In order to address these limitations, Ajzen (1991) developed an extended theory that he proposed by introducing additional variables, aiming for an in-depth measurement of employees' behavior. Ajzen called his new theory the Theory of Planned Behavior (TPB).

### 2.2.3.2 Theory of Planned Behavior

The concept of Planned Behaviour was proposed by Icek Ajzen in an attempt to address the limitations and improve on the predictive power of the Theory of Reasoned Action TRA. After discovering that behavior is not totally voluntary and thus cannot be controlled all the times; thus, the Perceived Behavioral Control was included in the model, and the theory was renamed Theory of Planned Behavior (TPB) (see Figure 3 below).

**Figure 4 Theory of Planned Behavior**



**Source: Ajzen (1991, p.27)**

A descendant to the theory of Reasoned Action, the theory of Planned Behavior is one of the behavioral models that are commonly applied; it helps in explaining how the behavior of individuals can change. According to the model, and because a behavior is planned, it thus predicts deliberate behavior (Ajzen, 1991). Similarly, to TRA, the Planned Behavior theory proposes that strong intentions to perform a specific behavior will create higher probability of occurrence for that specific behavior. The increased perceived behavioral control is formed of two dimensions: self-efficacy and controllability. Self-efficacy refers to the level of difficulty needed to perform the behavior, or one's belief in their own capability to succeed in performing a certain behavior. Controllability refers to the outside factors, and one's belief that they personally have control over the performance of the behavior. A person who has a high Perceived Behavioral Control usually has an increased confidence that they are able to successfully perform a specific behavior

According to the TPB, any taken action is guided by three types of beliefs: behavioral beliefs, and these are beliefs about what the consequences of the practiced behavior might be), normative beliefs, and these are beliefs about the normative expectations of other people, and control beliefs,

and these are beliefs about the presence of factors that can facilitate or obstruct the performance of the behavior (Ajzen, 1985); (Ajzen & Madden, 1986).

### **2.2.3.3 Acceptance Models**

To discover and analyze what makes people accept or reject technology, several acceptance models were designed. Fred Davis designed his Technology Acceptance Model (TAM) in 1989 rooted in the above-mentioned theories and using the intention to use as one of its constructs. The model asserts that among several variables, two factors namely Perceived Usefulness (PU) and Perceived Ease of Use (PEU)—play major roles in technology acceptance. The first factor, Perceived Usefulness is defined as “*the degree to which a person believes that using a particular system would enhance his or her job performance*” and Perceived Ease of Use is defined as “*the degree to which a person believes that using a particular system would be free of effort*” (Davis, 1989, p. 320). The model indicated that system usage is indirectly affected by both PU and PEU.

In theory, the TAM considers that “*perceived usefulness and perceived ease of use determine users’ behavioral intention and actual usage*” (Ramayah, et al., 2011, p. 126). Moreover, Taylor and Todd (1995) talk about two types of attitudinal beliefs that the TAM provides: the perceived usefulness and the perceived ease of use. These two beliefs affect the attitude. According to the reviewed literature, the perceived risk in the mind of a participant would increase when a certain new type of technology cannot be experienced (Campell & Goodstein, 2001). Whereas according to Davis (1989), the perceived ease of use is the extent to which the participant thinks that a certain system can reduce his/her problems both physically and psychologically. The perceived usefulness is the extent to which users think that a certain system can affect work efficiency.

Many researchers have ever since conducted empirical studies to test the explanatory power of the TAM model and most of the results produced were relatively consistent on the acceptance behavior of Information Technology users whereas others have used an extended form of the model (Venkatesh & David, 2000); (Horton, et al., 2001).

In addition to TAM, there are several theoretical models that have been used to predict adoption and technology usage. The most dominant ones can be grouped in eight prevailing models ranging from human behavior to computer science. It is through the integration of these constructs that

Venkatesh, et.al. (2003) devised what they entitled Unified Theory of Acceptance and Use of Technology or UTAUT, a framework to predict technology acceptance in the organizational settings. The eight models are: Theory of Reasoned Action (Fishbein & Ajzen, 1975), Technology Acceptance Model (Davis, 1989), Theory of Planned Behavior (Ajzen, 1991), Model of PC Utilization (MPCU) (Thompson, et al., 1991), Innovation Diffusion Theory (Moore & Benbasat, 1991), Motivational Model, Combined TAM and TPB (Taylor & Todd, 1995), Social Cognitive Theory (Compeau, et al., 1999).

The Unified Theory of Acceptance and Use of Technology (UTAUT) model was validated to provide a unified theoretical groundwork to promote research on information systems (IS) or adoption of IT. The model suggests four parameters that directly determine users' behavioral intentions and use behavior these parameters include performance expectancy, effort expectancy, social influence and facilitating conditions. Moreover, the model assumes that factors such as age, gender, experience and voluntariness to use have a moderating effect on these key parameters (Venkatesh, et al., 2003).

The concept of UTAUT was developed through reviewing, integrating and mapping eight dominant theories and models which are: 1. "The Theory of Reasoned Action (TRA)", 2. "The Technology Acceptance Model (TAM)", 3. "The Motivational Model (MM)", 4. "The Theory of Planned Behavior (TPB)", 5. "A blended Theory of Planned Behavior/Technology Acceptance Model (CTPB-TAM)", 6. "The Model of PC Utilization (MPCU)", 7. "The Innovation Diffusion Theory (IDT)", and 8. "The Social Cognitive Theory (SCT)". These models and theories have been utilized in a variety of previous studies (Venkatesh, et al., 2003) (Wu, et al., 2011) on technology or adoption of innovation in different sectors including marketing, psychology, and management science.

According to Venkatesh et al. (2003)'s UTAUT, there are four main factors that influence an employee's intention and usage of information technology. The first factor is performance expectancy, or what they defined as the extent to which a person believes that the usage of a system would help in achieving gains in his/her job performance.

The second factor is effort expectancy, or the degree of ease associated with the use of the system. Third factor is facilitating conditions, and this factor is related to the individual's belief in how

much the technical and organizational infrastructure are capable of supporting the use of the system. The fourth factor is social influence, or the individual's perception of what others believe regarding his or her use of the new system.

### **Performance expectancy**

The theoretical background of this factor comes from the combination of different constructs from different models: usefulness perceptions from Technology Acceptance Model, extrinsic motivation from Motivation Model, job-fit from Model of PC Utilization, relative advantage from the Innovation Diffusion Theory, and outcome expectations from Social Cognition Theory (Compeau & Higgins 1995). According to

### **Effort Expectancy**

In UTAUT, effort expectancy or the degree of ease associated with the use of the system. According to Venkatesh et al. (2003), this factor was derived from the perceived ease of use factor as proposed in Technology Acceptance Model (TAM).

Davis (1989) found that people tend to accept an application if it is perceived to be easy to use. According to Zhou, et al. (2010), Effort Expectancy affects users' behavioral intention, and according to Deng, et al. (2011), performance expectancy and effort expectancy are both significant predictors of the intention to use WBQAS (Web Based Questions and Answers Services).

### **Social Influence**

Social influence is similar to "subjective norm", a factor defined in Technology of Acceptance Model (TAM) 2, which is an extension of TAM.

In TAM 2, subjective norm has a significant direct effect on usage intentions over and above perceived usefulness and perceived ease of use. According to Schepers and Wetzels (2007), subjective norms are partially mediated by attitude towards technology use. Social influence is defined as the degree to which a user perceives that influential people in his/her life think that technology use to be important (Diaz & Loraas, 2010). According to Venkatesh et al. (2003), perceived usefulness is significantly influenced by subjective norm through internalization where

people incorporate social influence into their perception of usefulness and also through identification whereby people gain influence within their work team, and thus improve their job performance, especially in the early stages of their experience (Keong, et al., 2012). Maldonado et.al (2011) state that learning motivation and social influence have a positive influence on behavioral intention.

### **Facilitating Conditions**

Facilitating conditions is defined as the degree to which an individual believes that organizational and technical infrastructure exists to support the use of the system.

The UTAUT is theorized to model the relationship between the organization's attempts to overcome barriers to use and the potential users' intent to use. According to Gupta et al. (2008) performance and effort expectancy, social influence and facilitating conditions all positively impact the use of the ICT.

Venkatesh et.al. (2003), and despite the wide acceptance of UTAUT, proposed an extension of UTAUT into UTAUT2 through the incorporation of three additional constructs namely: hedonic motivation, price value, and habit.

### **Hedonic Motivation**

Hedonic motivation or perceived enjoyment or how much fun an individual can derive from using technology and this is an influential factor in technology acceptance and use (Brown and Venkatesh 2005) (Thong et al 2006).

### **Price Value**

This is the second factor that was added in UTAUT 2. It is more related to consumer use setting rather than the organizational use setting.

### **Experience and Habit**

The last construct added to UTAUT is experience/habit: two related yet distinct constructs. Venkatesh et al. (2003) used the passage of time as a base for the three levels according to which experience operates: (1) post-training refers to when the system was initially available for use; (2)

one month later; (3) three months later. As for habit, it is the extent to which people tend to perform behaviors automatically because of learning (Limayem et al., 2007).

The extensions proposed in UTAUT2 produced a substantial improvement in the variance explained in behavioral intention and technology use (Chang, 2012).

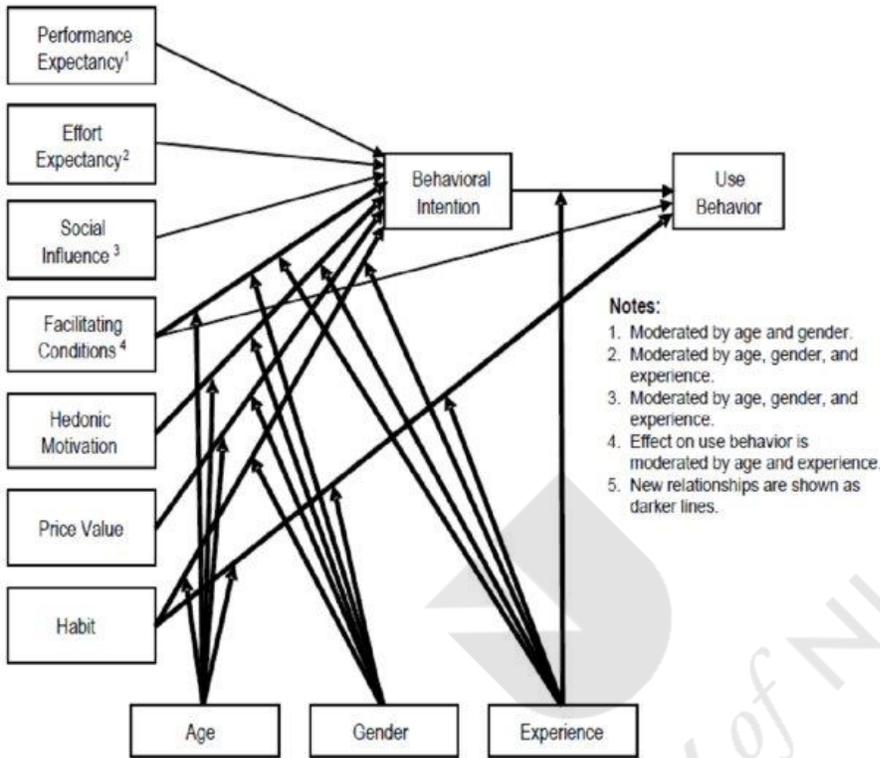
A summary of the relevant literature to be studied is presented in table 4 below:

**Table 4 Concepts and References about UTAUT’s Influential Factors**

<b>Concepts</b>	<b>References</b>
<b>UTAUT’s four influential factors</b>	
<b>Performance expectancy</b>	(Compeau & Higgins, 1995)
<b>Effort Expectancy</b>	(Davis, 1989), Venkatesh et al. (2003), (Deng, et al., 2011)
<b>Social Influence</b>	(Venkatesh, et al., 2003), (Schepers & Wetzels, 2007), (Maldonado, et al., 2011), (Keong, et al., 2012)
<b>Facilitating Conditions</b>	(Venkatesh, et al., 2003) (Gupta, et al., 2008)
<b>Hedonic Motivation</b>	(Brown & Venkatesh, 2005) (Thong, et al., 2006)
<b>Price Value</b>	(Venkatesh, et al., 2003)
<b>Experience and Habit</b>	(Limayem, et al., 2007)

The extensions proposed in UTAUT2 produced a substantial improvement in the variance explained in behavioral intention and technology use (Chang, 2012). A summary of the constructs and their definitions is provided in Table 4 below.

**Figure 5 UTAUT2 Research Model of Venkatesh, Thong, and Xu (2012)**



**Table 5 Unified theory of Acceptance and Use of Technology: Contrasts, Definitions and References**

Core Constructs	Definitions	References
Performance expectancy	“The degree to which an individual believes that using the system will help him or her attain gains in job performance”	Venkatesh, Morris, Davis, and Davis (2003)
Effort expectancy	“The degree of ease associated with the use of the system”	
Social influence		

	“The degree to which an individual perceives that important others believe he or she should use the new system”	
Facilitating conditions	“The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system”	

When it comes to the extension on the UTAUT model, most extensions resorted to employing new moderation mechanisms or exogenous, endogenous or even new outcome mechanisms. For the new endogenous mechanisms, some of these studies included variables that predict behavioral intention and/or use of technology. For instance, when studying consumers’ use of mobile Internet services, Venkatesh et al. (2012) extension added the hedonic motivation and price value as new variables that predict behavioral intention; they also included habit as a new predictor of both intention and technology use.

Other extensions resorted to adding new moderation mechanisms or moderating variables to test their effect on the relationships between the independent and dependent variables. These new moderation mechanisms include individual differences. For instance Im et al. (2011) extended the model by adding culture as a moderator in their study that compared Korea vs USA. Other studies extended UTAUT using exogenous mechanisms. For instance, Brown et al. (2010) identified a set of characteristics as predictors of the four UTAUT predictors. Some studies, and although very rare, examined new performance-based outcomes. Xiong et al. (2013)’s study is one of these few studies where the authors extended the UTAUT model by using Job fit, attitude, self-efficacy, and anxiety as new endogenous mechanisms but also examined economic development as a new performance-based outcome.

## 2.4 Learning Theories

### 2.4.1 Constructivism Approach

Constructivism is defined as *'an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner'* (Elliott, et al., 2000, p. 256).

For Constructivism, there are several main notions about learning and knowledge. One of the important notions is that learning is constructed, in the sense that learners build new knowledge founded on previous learning experiences. The second notion is that learning is not a passive but rather an active process and learners construct knowledge through their active engagement such as problem solving, experiments... etc. It is through meaning connections between prior knowledge, new knowledge and the learning process that understanding is formed (McLeod, 2019).

Constructivism promotes learning as a social activity. According to Dewey (1938), learning is not an abstract concept; it is something we do together and in interaction with each other. Community plays a central role in the process of making meaning (Vygotsky, 1978) which makes learning a matter of sharing socially constructed knowledge.

There are three main form of Constructivism: Cognitive constructivism developed by Jean Piaget, Social constructivism based on the work of Lev Vygotsky, and Radical constructivism based on the work of Ernst von Glasersfeld. For Cognitive constructivism, learners actively construct knowledge based on their existing cognitive structures which makes learning relative to their stage of cognitive development (Piaget, 1971). With Cognitive constructivism, learners are assisted to assimilate new information to their existing knowledge and allow them to make modifications to their intellectual framework to accommodate that information (Vygotsky, 1978). In social constructivism, knowledge develops from the interactions of individuals with their society and thus learning is a collaborative process. Radical constructivism states that all knowledge is constructed rather than perceived through senses; this knowledge tells us nothing about reality, and thus, knowledge is invented and not discovered.

According to Overbay et al. (2010), Constructivism emphasizes on facilitating knowledge construction through the connection of new concepts to prior beliefs. The use of technology should

engage students and make them have deeper connections with the learning materials so that they can deduce meaning rather than just repeat information without analyzing them. Technology is thus a set of tools to construct knowledge through such means as simulations, hypermedia and “problem-based learning environments” (Mayer, 2003). Using mobile applications, distance-learning platforms and course-building software suites are some examples of ways that combine technology and education together (Asamoah & Oheneba-Sakyi, 2017).

According to Murray & Blackman (2006), the potential success or failure of developing teams is affected by effective socially constructed learning. The authors believe that the literature on teams assume that learning occurs, but it does not clarify the way this happens and its impacts. Consequently, there is a need to study if collective intelligence can be a factor affecting teams’ development and thus e-learning adoption since studies found that a team’s collective intelligence is influenced by several factors that can mainly be grouped into two categories: the group composition and the group interaction (Wooley, et al., 2015). For this cause, the researcher will be elaborating more about these categories in the coming sections.

**Table 6 Constructivism**

Concepts	References
<b>Constructivism</b>	(Piaget, 1971), (Vygotsky, 1978), (Overbay, et al., 2010), (Mayer, 2003), (Asamoah & Oheneba-Sakyi, 2017).

#### **2.4.2 Connectivism a Learning Theory for the Digital Age**

Whenever there is creation of instructional environments, educators resort to using one of three learning theories: constructivism, behaviorism and cognitivism. However, nowadays and with the technological advances and because of its impact on learning, theories should become more reflective of the social environments in which we live. No doubt technology has affected the way we work, live and communicate over the past decades... and surely it has also reorganized how we learn. In fact, “*Learning must be a way of being—an ongoing set of attitudes and actions by*

*individuals and groups that they employ to try to keep abreast of the surprising, novel, messy, obtrusive, recurring events . . .” (Vaill, 1996, p. 42).*

In the past, a degree would allow the learner to choose a career that could last for a lifetime, and acquired knowledge would last for decades. Today, knowledge is measured in years and even in months. According to Gonzalez (2004), the rapidly shrinking life of knowledge is challenging and thus organizations are required to find ways and develop methods to stand against what he called “Half-life of knowledge”.

Connectivism is considered as a theoretical framework used to understand learning. In the connectionism model, there is a community of learning and knowledge is distributed across an information network and is stored in digital formats. According to Siemens (2004), this community is formed of similar areas of interests and this allows its constituents thinking together, interaction and sharing of dialogues. He believes that learning and knowledge can be found in the diversity of opinions.

According to the theory of connectivism, knowledge is distributed across an information network and can be stored in a variety of digital formats. Learning and knowledge are said to “rest in diversity of opinions” (Siemens, 2008, para. 8). Learning transpires through the use of both the cognitive and the affective domains; cognition and emotions where both contribute to the learning process in important ways.

Connectivism considers that there are two important skills that can contribute to learning; the first skill is the ability to search for current information, and the second skill is the ability to filter secondary information. According to Siemens (2005), the capacity to know is more important than what you actually know.

Some of the main principles of connectivism are:

- Learning and knowledge are found in the diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- The ability to know is more important than what is currently known.
- Maintaining connections is needed to facilitate continuous learning.
- The capacity to see links between domains, ideas, and concepts is a core skill.

- When it comes to Connectivism, accurate and up-to-date knowledge is the goal of all learning activities.
- Decision-making is in itself a learning process, and while a certain answer is right now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

Ireland (2007) compared Connectivism to other learning theories and showed how it differs from other established paradigms. The chart below show similarities and differences between Connectivism and three major philosophical perspectives.



**Table 7 similarities and differences between Connectivism and three major philosophical perspectives. Source (Orey, 2018)**

Questions	Behaviorism	Cognitivism	Constructivism	Connectivism
How does learning occur?	Black box – observable behavior main focus	Structured, computational	Social, meaning created by each learner (personal)	Distributed within a network, social, technologically enhanced, recognizing and interpreting patterns
What factors influence learning?	Nature of reward, punishment, Stimuli	Existing schema, previous experiences	Engagement, participation, social, cultural	Diversity of network
What is the role of memory?	Memory is hardwiring of repeated experiences - where reward and punishment are most influential	Encoding, storage, retrieval	Prior knowledge remixed to current context	Adaptive patterns, representative of current state, existing in networks
How does transfer occur?	Stimulus, response	Duplicating knowledge constructs of "knower"	Socialization	Connecting to (adding nodes)
What types of learning are best explained by this theory?	Task-based learning	Reasoning, clear objectives, problem solving	Social, vague ("ill defined")	Complex learning, rapid changing core, diverse knowledge sources

## 2.5 Massive Open Online Course (MOOC)

The world has been dramatically changing in all domains:

On one hand, technological advances and globalization have drastically changed the way the world interacts. On the other hand, COVID-19 has dramatically changed the way the world connects, and e-learning and MOOCs have dramatically changed the way the world learns...

MOOCS or Massive Open Online Courses are online courses available for everyone to enroll in, and some are for free. There are MOOCs that apply the so-called airline budget analogy in which the base price of the course would include the delivery of the material and all additional things would be charged as additional cost (Ktorido, 2021). Learners, and based on their needs, would pay as they go along. In some MOOCs, learners start the course for free and have to pay at a later stage. Millions of people from all over the world have been using MOOCS and with the spread of the Coronavirus pandemic in 2019, the number increased.

MOOCs as a term was coined in 2008 by Bryan Alexander and Dave Cormier (Nisha & Senthil, 2015). These courses are popular since they provide opportunities to large numbers of participants, regardless of where they are located, to access free-of-charge quality education through one medium, the internet (Gulati, 2013).

Some MOOCs are usually formed of pre-recorded video lectures (Hoy, 2014) along with learning material of very high quality (Means, et al., 2009). Other MOOCs have discussions forums on their platforms to allow clarification of doubts (Hoy, 2014). And because internet is available almost everywhere across the world, learners who have access to internet take advantage and choose to enroll in a MOOC thus interact with top educational institutions either free or at a substantially low cost (Wu & Chen, 2017).

In 2018, the number of learners who registered to attend a MOOC was over 100 million (Shah, 2018). Well-known MOOCs providers such Coursera (implemented by Stanford University) and EdX (implemented by Massachusetts Institute of Technology, Cambridge and Harvard Universities) have significantly contributed towards the growth of MOOCs.

MOOCs developers aim at developing innovative platforms through which they can provide affordable and accessible education to large number of learners (Altbach, 2014). Therefore, it is crucial for MOOCs developers to understand the factors that influence the acceptance of MOOCs by learners.

Participants use them to learn and for a variety of reasons. Some use them to achieve lifelong learning, others for career developments, and others for the hope of a career change. Students use it for college preparations, while companies & organizations are resorting to them to for career

corporate e-Learning & training. Recently the majority has been using them because unfortunately it was their only choice as they couldn't choose on campus learning in the middle of the pandemic.

Though they date back to the early 2000's, Massive open online courses (MOOCs) started earning a lot more attention since 2012 (Yao, et al., 2013). According to McAuley et al. (2010), effective participation in MOOCs requires learners to possess and show senses of self-organization, goal-orientation, and active engagement in the learning process. This would somehow make it suitable for professionals who would deliberately choose to enroll in a MOOC.

The OER or what is termed as Open Educational Resources is a movement that has grown worldwide and in a very rapid way ever since 2001 when the Massachusetts Institute of Technology announced its plan for open courseware.

OER concept was then proposed in 2002 by UNESCO along with the internet-based digital materials that can be used and reused by everyone, in an open and free way for the purpose of researching, teaching, training and learning. Later on, and with the passing of time, more educational institutions decided to join this movement to give the learners a free access to resources. Later on, the movement changed focus and shifted from resources to learning with Siemens and Dave Cormier who coined the term MOOC (Rollins, 2018).

According to Rollins (2018), a technical pillar and an ideological pillars have been historically MOOCs' two founding pillars. The technical pillar is related to distance learning which in turns is related to technology and the advances of technology to which we can now add the social platforms through which learners can find ease in communication and idea sharing. The second founding pillar is based on the idea of "Education for All". A movement that became popular in Europe in the 20<sup>th</sup> century which is about providing theoretical and practical skills to every participant who would want to attend, regardless of their age, their financial situation, or social level. The booming of the internet helped in the emerging of other movements that support the democratization of education.

Compared to other open education products, MOOCs cover a larger scope. They include in addition to resource sharing, other components such as lecturers, support during the learning process, curriculum evaluation, and certificates for the learners who chose to take the experience to a higher level (Gabi, et al., 2016). This makes the orchestration of these components critical for administrators if they want to ensure a successful MOOC development and operation. Because

MOOCs are part of a larger family of online and open courses, it would be helpful to check some of their characteristics. Khan (2005) proposed a framework that takes into consideration the design, delivery, evaluation of either online or blended learning. This framework can be described as the effective integration of eight dimensions summarized below:

- Institutional dimension, which is related to the administration such as policy making, accreditation, etc.
- Pedagogical, related to teaching and learning such as content design, curriculum that will be followed, etc.
- Technological, related to the infrastructure and what platform to use.
- Interface design, related to design of the learning site and usability testing.
- Evaluation, related to evaluating the performance of the learners and learning environment.
- Management, related to the maintenance of that learning environment.
- Resource support, related to providing support in technical issues as well as providing professional development.
- Ethical considerations, related to social and political issues such as copyright, fair use, etc.

Gabi, et al. (2016) proposed an open learning model. This model postulated that for a learner's better experience, a MOOC program should:

- 1) Perform a convenient and supervised assessment,
- 2) Verify the identity of the learners who will be taking these assessments,
- 3) Collaborate with other institutions,
- 4) Award credits to participants,
- 5) Design a quality assurance system,
- 6) Provide certificates for the participants to acknowledge their achievements.

Several MOOC experts from several countries all over the world attended a 2-day conference in 2016; the result of this conference was a guideline booklet in which they summarized all the important points that need to be present in order to insure quality and accreditation of MOOCs. In this booklet, they specifically address MOOCs' providers and institutions urging them to identify the purposes of using MOOCs. They consider that it is very important for these institutions and

providers to consider all the resources required to design, develop and implement MOOCs, whether human, financial or technological resources.

Liu, et al. (2019)'s review findings also support the previous results especially when it comes to the elements that need to be considered while developing and implementing MOOCs.

According to George Siemens, from "Technology Enhanced Knowledge Research Institute" at "Athabasca University", the most important elements of MOOCs are the internet and people, and people are free to do whatever they want to do; thus, they are encouraged to create "their own spaces" (Siemens, 2004). This assumes that educational institutions need to stop providing learners with the space to interact and allow them to bring their own spaces with them, which means they should have their own archives. They wanted the social interaction between learners to provide a content. The content is just a catalyst to form the connection because in the university, the learning experience stops with the completion of the course. With the internet, this connection exists well beyond the allotted course time. Social elements are important in this context, and this pushed the researcher to want to investigate if another factor, the social perceptiveness factor, can also influence learners' intention to attend and complete MOOCs.

In fact, a MOOC is not necessarily limited to a specific "digital space." Participants can share their experiences on Twitter, write about it in a blog, hold Zoom, Skype, Meet-ups and Hangout sessions. Both the offline and the online space can be used (Chattopadhyay, 2014). A networked course does not have a center. Learners will dialogue around the content and create social interaction.

Talking about how it works, and the educational philosophy behind it, Siemens (2004) explains that with MOOCs, there is the experimentation with the dissolution of the boundaries that an institution controls and that inhibits or permits learners' interaction and have it exclusively under the control of the learners. According to Siemens (2004), learners begin to form a narrative of coherence through the social network as a sense-making guide so they can find their ways through complex settings and still achieve clear outcomes. Higher education requires outcomes, and meaningful outcomes can be done through distributed ways/ means while still settings targets. However, no research concluded that linear structures produce better outcomes than chaotic

meandering structures. The intent is to show, and based on theories of learning, that making sense of this chaos is at the heart of this learning experience. If the teacher provides all the content, then it is like telling the learners to walk the path that he/she has formed.

Feedback from peers is important because even though the instructor has an area of expertise, the social networks can be there to validate it.

A complex subject matter cannot be cognitively apprehended the same way the linearly structured area of knowledge is. When you engage in this complex knowledge there are two notions: the first notion is the notion of way-finding through navigating these spaces in which educators can be contributing guide, and the second notion is the notion of social sense making. For instance, the corona virus was identified as being reason for the Severe Acute Respiratory Syndrome (SARS); this was not done in just one lab. The collected data from one geographical area was passed on to the next area to work on and the complex knowledge was distributed and networked. If we recognize this complex knowledge, then the question would be how can the institution effectively help the learners to mirror their learning process with the actual point of knowledge?

MOOCs can be defined as a non-defined form of pedagogy to organize the learning/teaching experience in an online, informal, and collaborative way (DeWaard, 2013).

MOOCs present the trend of internet combined with education. When it comes to MOOCs there is no limit neither to the number of learners nor to the domains and classrooms where the courses are given. They do not make any social distinctions and the courses are chosen based on learners' interest without any entrance exams or prerequisites (Xiong, 2018). According to Alatabi (2014), MOOCs are neither limited to a place nor to time which makes them convenient to the learners who can thus choose the pace of their leaning experience and adjust it accordingly.

The main differences between a MOOC and a traditional online course are summarized as follows. Online courses are usually chosen for the learners by the university or the organization they are part of. Online courses, are oriented towards learners who are expected to learn in isolation and individually; whereas, in MOOCs, learners can be grouped to form cohorts and groups thus facilitating the success of communities of Practices. MOOCs' content is not static; it is very dynamic and evolves through learners' participations. In addition to being effective in fostering some of the critical 21<sup>st</sup> Century skills such as teamwork, self-driven learning, sense-making and

problem-solving, the learners in MOOCs are both creators and consumers thus making learning through MOOCs a two-way process. Hence participants will “learn how to learn” while finding their own strengths and weaknesses (Chattopadhyay, 2014).

Although many studies investigated the adoption theories, few have investigated MOOCs as a form of E-learning and among professionals using the UTAUT and the independent factors of Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions as predictors of learners’ acceptance to attend and finish a MOOC. The several models that already exist (Theory of Planned Behavior, TAM, and even UTAUT) and to the researcher’s knowledge, have not taken all the aspects mentioned above into consideration. The researcher is particularly interested in testing whether Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions influence learners’ intention to attend MOOCs as a form of e-learning adoption, especially among professionals. The researcher has formulated these inquiries in the following research question:

**R.Q.1** Do Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions positively affect the behavioral intentions of learners to attend MOOCs?

## **2.6 Social Perceptiveness and Emotional Intelligence (EI)**

Emotional intelligence (EI) refers to the ability of being aware and the capability of understanding as well as efficiently managing one’s emotions and understanding others’ emotions too.

Recently, EI has become an important research topic when it comes to traditional learning environments. However, its implication can go beyond that to even affect new learning environments.

Although Emotional Intelligence is considered a fairly new topic of research, there are various studies about it and several definitions that can be sometimes even contradictory with some considering EI as a predictor of success (Goleman, 1995). Up until lately, it has been thought that, for individuals to adapt and sustain the changes that the world is witnessing, Intelligence Quotients (IQs) are needed as they are considered to account for education or job performance (Shukla & Srivastava, 2016). However, with all the changes that the era of globalization is witnessing in all

domains whether in the economic, educational, technological, healthcare, etc. studying other forms of intelligence becomes imperative.

Over the years, the concept and definitions of EI have remarkably evolved. Theorists such as Thorndike, Wechsler and Gardner were among the first scholars to initiate awareness about the concept of EI, and this fact has paved the way for pioneers well-known today in the field of EI such as John Mayer, Daniel Goleman, Peter Salovey.

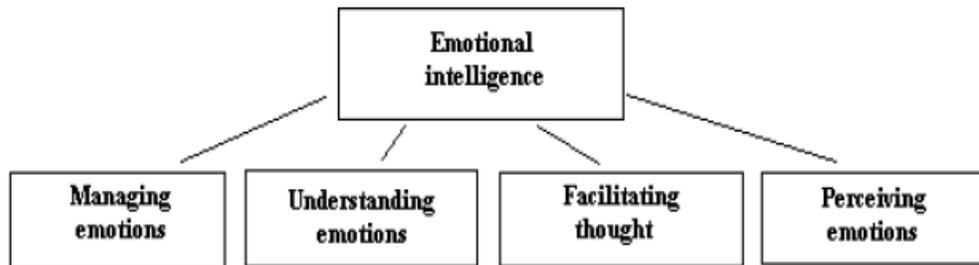
Identified as “social intelligence” in the 1930s, the concept of Emotional Intelligence continued to develop during the decades that followed till 1995 when it became well-known and popular thanks to a published article by Daniel Goleman entitled “Emotional Intelligence: Why It Can Matter More Than IQ” (Goleman, 1995).

The term Emotional Intelligence (EI) was first coined by Salovey and Mayer in 1990. According to these authors, emotional intelligence refers to a subset of social intelligence, in other words, it is defined as the ability of an individual to differentiate and monitor one’s feeling and others’, and as such, to be able to guide actions and thinking (Salovey & Mayer, 1990). It is through Emotional Intelligence that individuals can use emotions to develop thinking and validate reasons.

According to Richards & Pryce (2006), an individual with high emotional intelligence is more capable of reducing stress, improving his/her performance and this would reduce turnover. As such, the term emotional intelligence has been also linked to ability and competency to change, to adapt and efficiently manage stressful situations and unpleasant emotions without breaking; it correlates with optimism and happiness (Goleman, 1995).

Salovey and Mayer (1990) designed a model with four branches to explain and describe EI (see Figure 5).

**Figure 6 The model of Emotional Intelligence on four branches according to (Salovey & Mayer, 1990)**



Researchers have tried to study and prove that emotional expression has become a form of social communication. Emotions can be perceived through nonverbal reception, and the way a person thinks is guided by the way he/she feels. If a person is capable of understanding emotions and the message conveyed through these emotions, then his/her capacity to reason becomes greater and more important. They added that if one can manage his/her emotions, then they will be able to build a comfort zone and this will increase their abilities to think (Salovey & Mayer, 1990).

Some scholars think that Emotional Intelligence offers an accurate recognition of one's own and other's emotions; it is through EI that a person is capable of controlling and managing one's feelings; it provides self-motivation, emotional empathy, shows a possession of good social and communication skills as well as the ability to adaptively and responsively respond with behaviors and emotions to various life situations and thus achieving a response with appropriate adaptive emotions and behaviors in different life situations and ultimately achieving balance between personal, educational, professional and social life (Jena & Pradhan, 2014).

According to Mayer and Salovey (1990), an emotionally intelligent person has skills to identify, use, understand and regulate emotions which allow to effectively manage dilemmas and navigate the social world; it is an important concept that helps to better understand individual differences.

Mayer and Salovey (1997) believe that people's emotional perception and understanding vary in their accuracy, and this is accounted by emotional intelligence. A more formal definition is

“understand and reason with emotion, and regulate emotion in the self and others” (Sternberg, 2001, p. 401).

Hejase et al. (2021) suggested a cross-multiple relationships studies between EI and different concepts to discover possible theoretical links that can help people and organizations benefit as they implement EI in organizations. Understanding emotions is one of the four branches of EI, and one of the main components of social perceptiveness which will be investigated in this research as a potential moderator.

Social perceptiveness is related to ‘Theory of Mind’ or ‘ToM’ which consists of the ability to use certain mental states concepts such as beliefs, emotions, goals, etc. for the purpose of predicting and interpreting behavior (Westra & Carruthers, 2018).

Theory of Mind, also called “Mentalizing” (Apperly, 2012) or “mind reading” (Heyes, 2014), is distinctly a human ability that helps people make inferences about others’ mental states; ToM has been researched with a growing number of studies focusing on analyzing the importance of the individuals’ ability to infer about the mental states of others (Engel, et al., 2014). The authors state that ToM is among “*the small group of abilities within the broad category of emotional intelligence that can be most reliably measured*” (Engel, et al., 2014, p. 4). Although personality variables seem limitless, academic psychology seems to agree on five personality traits when it comes to explaining an individual’s personality. These traits are: extraversion, conscientiousness, agreeableness, emotional stability, and intellect or imagination. The most widely used and accepted model of personality is the Big Five model, and it has been used in several research contexts and domains (Block, 1995).

Previous studies have shown an association between personality and a range of behaviors (Ozer & Benet-Martínez, 2006) such as leadership and job performance (Mount, et al., 1998). Nye, Orel, and Kochergina (2013) discussed that the importance of the Big Five traits in team settings. Some studies relate social perceptiveness to female presence and to female proportion in a group. Scholars found that compared to males, females are significantly better on the theory of mind test (Baron-Cohen, 1997).

This finding comes in harmony with earlier work done by Hall (1978), and it is strongly associated with the percentage of females in a group which is the second factor identified as significantly correlated with CI.

According to Engel et al. (2014), and similar to the ToM measure, the proportion of females in groups is a strong predictor of CI across communication media whether face-to-face or online.

The percentage of females as a predictor of CI can be explained through statistical inference. There are apparent gender differences in cognitive development, such as females being superior in tests like the Reading the Mind in the Eyes (RME) test and males being superior in tests utilizing spatial skills (Witelson, 1976); (Halpern, 1992); (Kimura, 1992). Therefore, it can be argued that for a group to be collectively intelligent, there is a need for several members who are high in social perceptiveness regardless of the genre. In case the group includes females then the chances of achieving higher social perceptiveness are increased. In other words, if a team is formed by highly socially perceptive members, then it may not be of great significance whether they are females or males.

These many aspects have been examined extensively by many scholars as the reviewed literature shows (Halpern, 1992); (Kimura, 1992); (Baron-Cohen, 1997) etc. However, there is no identified source that treats and explains any potential relation with e-learning adoption. Which makes us wonder if social perceptiveness can be a moderator that affects learners' adoption and technology acceptance for E-learning and more specifically MOOCs? More specifically, can it moderate the relations between Behavioral intention and each of the independent variables, Effort Expectancy and Social Influence? This led to formulate the following research questions:

**RQ 2:** Is the relationship between Effort Expectancy and Behavioral Intention moderated by Social Perceptiveness?

**RQ 3:** Is the relationship between Social Influence and Behavioral Intention moderated by Social Perceptiveness?

## **2.7 Group Work Effectiveness and Collective Intelligence (CI)**

Teamwork offers a potential of more achievement compared to when one works alone. However, it is important to stress on the various abilities, skills, and knowledge available in that team, especially when it comes to an interdisciplinary team. It is important to move beyond the idea of gathering smart people in the same team to make it smart; instead, it is essential to think about how to make those people coordinate and collaborate effectively and thus to see what makes for a collectively intelligent team (Mayo & Woolley, 2016).

When it comes to professionals, an effective teamwork can immediately and positively affect work outcome. For instance, in healthcare, an increase in co-morbidities and in the complexity of care specialization is paralleled with an increase in the need for effective teams. Times have changed, and most professionals in organizations are not able to solely deliver a satisfying quality outcome (Babiker, et al., 2014). In fact, interdisciplinary teams are key for success on the long-term. Teamwork across boundaries is essential to provide both quality and quantity (Dixon, 2007). There has been an increased reliance on teams in many sectors. Failures in communication among professionals are considered as main reasons for errors (Makary & Daniel, 2016); add to this, teamwork has the capability to improve performance (Larson, 2010). However, for the implementation of an effective team-based, there should be training for all team members, in addition to creating for collaboration culture among interdisciplinary individuals of the team (Meisinger & Wohler, 2016).

According to Ekblaw (2016), group work and learning through projects in online learning are considered as valuable tools for education as they teach teamwork, improves group dynamics, and helps learner reach a deeper level of understanding for the course while fostering a higher level of cognitive abilities.

The following research will shed light on group and team performance and on group work effectiveness. The researcher intends to investigate whether the variable Group Work Effectiveness can be considered as a construct that affects e-learning adoption, specifically MOOCs. An extensive literature review is conducted on teams, and the collective intelligence that a team can have and that will make it a smart team.

### 2.7.1 The g Factor

Defined as a general capacity that involves the ability for planning, reasoning, thinking in abstract ways, problem solving, reasoning, and problem solving, intelligence reflects humans' broad and deep capability for comprehending their surroundings (Gottfredson, 1997). Based on the above, it can be deduced that the combination of the following two abilities form intelligence: the ability to immediately figure things out and the ability to remember and repeat things that have been figured out in the past.

Many studies indicate there is a common single factor that predicts the differences in the performance of individuals who perform a wide variety of cognitive tasks (Spearman, 1904); (Deary, 2013). This factor is called general intelligence or factor g, and it is a statistical factor that was discovered long before psychologists were able to discover the brain processes to which the factor can be actually interlinked. Many researchers have repeatedly demonstrated that general intelligence "g", emerges from the correlations among how well different individuals do a wide variety of different cognitive tasks (e.g., (Spearman, 1904); (Deary, 2000). This single factor can then be used to distinguish the personal performance levels of different individuals and to predict which are likely to perform well on other tasks in the future.

According to Spearman (1904), the g-factor is responsible for our performance on mental ability tests. G is the 'mental energy' displayed by the ability to handle symbols in addition to abstract ideas.

Scholars explain that "*people who are proficient at solving a given problem tend to be proficient at solving others; those less capable of solving that problem tend to be less capable of solving others. The psychometric representation of this phenomenon is the general intelligence or g factor, obtained whenever scores on a battery of diverse problem-solving tests are factor analyzed*" (Crinella & Yu, 1999, p. 299).

Despite all the mentioned above, many scholars challenged the concept of g-factor considering that the notion of intelligence could not be measured and summarized by a single number on an IQ test (Cherry, 2019).

### 2.7.2 The c Factor

Putting a number of intelligent persons in a group does not necessarily translate into an intelligent team (Woolley, et al., 2010). This conclusion stemmed from questioning why some groups perform better than others. As examined in the previous part, a huge progress has been made to define and measure individuals' intelligence (Deary, 2000; Woolley et al., 2010); for decades, scholars have studied group performance in specific tasks in various domains (Hackman and Morris, 1983; McGrath, 1984); however, measuring group intelligence in the same way individual intelligence is measured is still understudied (i.e. measuring the intelligence of the group by assessing how well this group can perform at a wide range of different tasks and then later on using the information to predict how that same group will perform at other tasks in the future).

Individual skills of the members of the group play an important role; however, this does not explain the different levels of performance among groups that have skilled members (Woolley, et al., 2015). Studies in the domain of social psychology, organization behavior and other fields tried to investigate the factors that predict group performance (Ilgen, et al., 2005); (Larson, 2010). However, they focused on one specific task to find the characteristics that lead most groups to perform well. More recent studies started focusing more on analyzing the general ability of a given group to perform well in a wide range of different tasks and not just one.

The studies that have adopted the statistical approach to measure individual intelligence  $g$  were also used for the purpose of measuring group intelligence and group performance; these studies showed that just like for individual intelligence, there is also a single statistical factor for groups (Woolley, et al., 2010); (Woolley & Bell, 2011). This factor is called 'Collective Intelligence' (CI) or factor 'C'. This factor is credited to predict how well the group that is being tested can perform in different tasks of various range (Engel, et al., 2015). Thus, Collective intelligence is "*a property of groups that emerges from the coordination and collaboration of and predicts group performance on a wide range of tasks*" (Engel, et al., 2015, p. 3769).

There are several definitions for collective intelligence. CI can be defined as the ability of a group to perform a wide variety of different tasks (Woolley, Aggarwal & Malone, 2015; Woolley, Chabris, Pentland, Hamish & Malone, 2010). Moreover, and according to Glenn (2013) it is "*an emergent property from synergies among three elements: data/info/knowledge; software/hardware, and experts and others with insight—that continually learns from feedback to*

*produce just-in-time knowledge for better decisions than any of these elements acting alone”* (P.235).

Studies found that a team’s collective intelligence is mainly influenced by several factors that can be grouped into two categories: (A) the group composition and (B) the group interaction. Within the group composition, three factors appeared to be correlated with CI (1) the team’s members’ average social perceptiveness, (2) the proportion of females and (3) cognitive diversity while conversational turn-taking and discussion participation are related to group interaction (Engel et al., 2014; Woolley et al., 2010). Those scholars found that collective intelligence is completely different from a metric of the quality of relationships in groups; in fact, some of the findings of these studies came in contradiction to main stream literature such as the claim that to have a well-functioning group, there’s need for social cohesiveness (Stokes, 1983), group satisfaction (De Dreu & Weingart, 2003), and psychological safety that allows a team to take interpersonal risks (Edmondson, 1999).

According to Woolley et al. (2010), satisfaction, group cohesion and motivation are not predictors of group performance.

Furthermore, studies about the first factor in team’s composition or the team’s members’ average social perceptiveness have shown that the average of social perceptiveness of the members of the group was a strong predictor of CI (Engel, et al., 2014).

Moreover, another factor is the level of cognitive diversity in a group, including perspectives and styles of thinking (Kozhevnikov, et al., 2014); the cognitive diversity is one of the aspects of group composition, and it is found to be strongly related to CI since it is directly associated with group members’ ability to communicate with each other.

Promoting teams and teamwork has become one of the most important organizational goals; however, some organizations do this despite not being certain about how different types of diversity contribute to performance.

In this context, the term “diversity” describes various types of individual differences. In general, Harrison and Klein (2007, p. 1200) define diversity as “*the distribution of differences among the members of a unit*”.

In general, diversity refers to any characteristic that makes an individual perceive others as different from self (Triandis, Kurowski, and Gelfand, 1994). This includes all sorts of differentiations using demographic characteristics such as differentiation in gender, education, occupation, values, age, race, marital status, functional background... etc. (Milliken and Martins, 1996; Jehn et al., 1999, Harrison and Klein, 2007; van Knippenberg and Shippers, 2007).

A significant number of research has shown evidence that teams diversity can lead to better performance outcomes (Horwitz and Horwitz, 2007; Martins et al., 2012; Lu, Chen, Huang and Chien, 2015). Moreover, it has been found that in highly uncertain environments, teams with diversity outperform homogeneous teams (e.g., Nemeth, 1986 ; Jackson, 1992; Gruenfeld et al., 1996; Richard, 2000; Hamilton et al., 2003; Mello and Ruckes, 2006).

In addition, studies reveal that, when it comes to collective behavior, the diversity of the team is essential and critical for successful group performance (e.g., Yun et al., 2011; Analytis et al., 2017) and collective intelligence in a wide range of tasks, such as problem-solving (Liker and Bokony, 2009) and decision-making (Krause et al., 2011; Lorenz et al., 2011; Mavrodiev et al., 2013; Conradt et al., 2013; Jönsson et al., 2015; Tump et al., 2018).

Attempting to provide a framework for research on diversity, Harrison and Klein (2007) propose three different types of diversity: (1) Separation, (2) Variety, and (3) Disparity. Separation refers to the team members' differences in beliefs, values, or attitudes concerning team goals. This type of diversity leads to conflict and thus reduced task performance (Byrne, 1971; Tajfel, 1981; Schneider and Goldstein, 1995). The second type of diversity, Variety, is concerned with the qualitative differences among the group members, and it based on information process theory (Hinsz et al., 1997) and the cognition theory (Harrison and Klein, 2007). A homogeneous group has minimum variety while maximum variety occurs when group members are from different pools of informational resources such as different economic sectors or distinct educational (functional) backgrounds. Thus, this type of heterogeneity in teams leads to richness in information, and consequently, the outcomes are higher quality of decision making, superior innovation and creativity, as well as increased flexibility. Disparity is the third type of diversity. It assumes that team members have different levels of attributes such as status, prestige, salary, and power. According to Harrison and Klein (2007), minimum disparity indicates that all team members have the same position while maximum disparity occurs when only one or two team

members possess socially valued resources. It suppresses creativity and leads to reduced cooperation and more competition among team members as well as offending behaviors or attitudes.

Moreover, according to Milliken and Martin (1996), diversity can be classified in two types: (1) observable diversity and (2) non-observable diversity. Researchers in organizational behavior tend to focus on characteristics of group composition that are prominent such as age, race, and gender (Tsui, Egan, and O'Reilly 1992; Pelled, 1996; Williams and O'Reilly, 1998). When differences are noticeable then the responses from this diversity would be the result of bias.

Furthermore, according to Jehn, Northcraft and Neale (1999), there are three types of diversity: (1) social category diversity, (2) cognitive diversity, and (3) value diversity. The first type, social category diversity, is about differences related to gender, ethnicity, race, religion, age, physical abilities...etc. The second type, cognitive diversity, is more concerned with differences in personality, motivation, experience, cultural background, training, expertise, education, and information (Mannix & Neale, 2005). The third type, value diversity, is about differences in the team's mission, goal or task. Preferably, a team is best to have high cognitive diversity and low value diversity. High cognitive diversity ensures that the team has the necessary tools and information to solve problems effectively, while low value diversity means the team is unified in its purpose (Medin, et al., 2010).

Aggarwal, Woolley, Chabris, & Malone (2015) conducted a study to investigate the effect of cognitive diversity in group performance. The study examines CI (Woolley, et al., 2010) and team learning (Argote, 2011). They found a relationship between diversity of cognitive styles and CI, in the sense that, groups that were diverse in cognitive styles performed better than groups formed of people with very similar cognitive styles or very different ones. Those who had very similar styles did not have enough skills to perform in different tasks, whereas those who had very different styles had difficulties in their communication and coordination within the team.

Findings of the studies mentioned above underline the importance of CI in understanding team performance drivers (Aggarwal, et al., 2015). They point to the existence of a strong correlation between CI and team learning, and that CI acts as a mediator between team learning and cognitive diversity. In addition, cognitive style diversity is found to indirectly influence team learning through CI.

On one hand, and regarding group performance, Mannix & Neale (2005) conducted a metaanalysis and reviewed studies that covered decades of research about diversity and the relationship between group performance and group members' differences in terms of skills and knowledge. They report that group performance can be improved by how the individuals care and are engaged and how they affect each other. Teams are valuable if they can effectively perform in changing environments while aligning the resources of all the members into processes to achieve consistency in performance (Aggarwal, et al., 2015). In fact, the effectiveness of a performance is related to the outcome and evaluated by an externally defined standard (Larson, 2010).

On the other hand, and as Hansen, Owan and Pan (2006) note, there are two serious difficulties in examining diversity. First, it is very difficult to separate the effect of salient demographic differences from the differences correlated with personal attributes such as personality, knowledge, and ability. Thus, it is difficult to identify the mechanism that mediates the effect of diversity. Second, in their aim to identify the mediating mechanism, most research focus on studying specific group process such as communication, commitment, and conflict. The result is that many studies fail to obtain clear implications about the overall impact of diversity on team performance.

Based on the above, and drawing back to the top-down and bottom-up process interaction that is involved in producing CI (mentioned previously), it is noteworthy to mention again that the c factor appears to depend on both the composition of the group and the interaction among group members like for instance the conversational turn-taking behavior (Michaelsen, et al., 1989); (Tindale & Larson, 1989). So, another factor significantly correlated with CI is concerned with the total amount of communication that takes place within groups. CI is found to be predicted by how equally work contribution and communication are distributed among group members (Engel et al., 2014; (Woolley et al., 2010). Moreover, it has been observed that groups, where the conversation is dominated only by few members, are less collectively intelligent than those with an equal distribution of conversational turn-taking (Pentland, 2008). This specific factor is also found to be positively correlated with c factor in both online and face-to-face groups (total amounts of spoken communication in face-to-face groups and written communication in online groups) (Engel et al., 2014).

Furthermore, individual as well as the group behavior can be explained by the concept of Transactive Memory Systems (TMS) through the examination of the ways through which these

individuals and group structure and process information. According to Lewis (2004), Transactive Memory Systems play a role in improving team performance, because they can make expertise available to the whole team and in an effective manner, in addition to enhancing productivity of the entire collaboration process.

By definition, a Transactive Memory System is a collective system of memory where individuals share an understanding of who knows what (Wegner, 1987). Members of a group can rely on one another's knowledge through the group's TMS; thus, there is no need to know everything themselves (Wegner, 1987). Transactive memory belongs to the whole group, and it is thus neither traceable to any of the individuals alone nor can it be found somewhere "between" individuals. Like collective intelligence, it is a property of the group itself (Wegner, 1986).

Transactive Memory Systems is one of the most extensively studied concept by scholars in the field of knowledge management. TMS has been considered to have a positive effect on a group's increased speed as well as reduced defects which are two of the important group outcomes. To Daniel Wegner, TMS is seen as knowledge of "who knows what" in a team; it is the process that builds, encodes, stores and retrieves knowledge about the expertise of each individual in the group (Wegner, 1987; Lewis & Herndon, 2011). According to Brandon and Hollingshead (2004), these processes describe how group interactions allow the development of Transactive Memory Systems. This exchanged knowledge would be "*encoded in a shared repository of knowledge, stored in individual and collective memories, and then retrieved when one desires to access that stored knowledge in the future*" (Kush, 2019, p. 104).

Transactive memory systems, just like collective intelligence, naturally emerge when people work together in a team.

Wegner, Giuliano, and Hertel (1985) state that it is important to take into consideration the components of these systems so that we can understand how they work. Usually, a person's memory involves processes that take place at three stages: stage one is the encoding stage, and it is when is the encoding of the information that enters the memory occurs. Stage 2 or storage stage is the stage where the information stays in the memory and the final stage or retrieval stage during which the information is recovered, and that is how the transactive memory enables each member of the team to benefit from the shared memory, noting that teams have a greater transactive memory than the individual memories of each of the team members (Wegne, Erber, and Raymond,

1991). Littlepage et al. (2008) note that in the case of a team, the total amount of knowledge is expanded because transactive memory allows the development of patterns that complement specialized knowledge.

Research on knowledge and thinking processes have concluded that the main indicators of Transactive Memory systems are specialization, credibility, and coordination. Transactive memory is developed when a team member understands the knowledge of someone else in the team and uses that understanding to develop different but complementary knowledge (Moreland, 1999). In fact, *“Members will only develop different knowledge if they can rely on others to remember other task-critical information. Absent this, members would likely develop overlapping or redundant knowledge instead of differentiated expertise. Specialization and credibility exist and are related because members have developed transactive memory and thus are true manifestations of TMSs”* (Lewis, 2003, p.590). According to Hollingshead (2001), cognitive interdependence among team members is key to effective transactive memory system. Numerous studies have arrived at the result that team membership itself does not prompt the development of transactive memory but rather the interdependence with others (Levine and Moreland, 1999; Moreland, 1999; Wegner et al., 1991). According to Brandon and Hollingshead (2004), there is a consensus that a person’s actions affect others’ outcomes; individuals depend on each other in a group so they cannot unilaterally guarantee good outcomes. Thus, the individual performance of each member is dependent to the performance of the other team members because each team member’s performance does not rely only on their own knowledge, but also on the knowledge of others in that team.

Brandon and Hollingshead (2004) claim that transactive memory systems vary in terms of three criteria. The first thing is accuracy or how accurate are the perceptions of group members when it comes to others’ task related expertise. The second one is sharedness or the degree to which the group members have a shared representation of the TMS, and the third one is validation or the degree of participation of the group members in the transactive memory system.

When team members solve problems together, then Transactive Memory Systems can lead to higher levels of team performance (Littlepage et al., 2008). Several studies have shown that a team’s performance can exceed the individual performance of the best member of that team when comparing these two performances regarding the completion of several tasks (Michaelsen, Watson

and Black, 1989; Tindale and Larson, 1992). This finding suggests that “*within a general domain of knowledge, persons who are not the most expert member can still contribute specific knowledge that can facilitate group performance*” (Littlepage, 2008, p. 226).

Transactive memory is developed when a team member understands the knowledge of someone else in the team and uses that understanding to develop different but complementary knowledge (Moreland, 1999). In fact, “Members will only develop different knowledge if they can rely on others to remember other task-critical information.

Historically, Group Effectiveness and group problem solving became the focus of several social psychologist and scholars after the success of community and other groups. As a result scholars started searching for methods to enhance processes, not just in a community context but also in the work place where there is a need for group of people or team to perform several tasks. Kurt Lewin's had a significant contribution to the understanding of groups, and this was based on the assumption effective change occurs not in individuals but rather through the interaction of a group members. In fact, Lewin (1943) studied the superiority of group decisions over individual decisions.

According to Aggarwal et al., (2015), when a team can align the members' resources into processes and perform effectively in changing and unstable environment, this team will be more effective and valuable than a team that collapses the moment there is a change in the environment. A team's effectiveness is the construct of inputs, processes, and outputs. It is more than just chores and tasks performance, it also includes the attitudes and behavioral outcomes of the team members (Cohen and Bailey, 1997; Kozlowski and Ilgen, 2006). Group work effectiveness is directly linked to the outcome and determined by the quality or score for a particular task (Larson, 2010).

However, and further to the above, we do not find any reference with regards to these aspects of collective intelligence, specifically Group work Effectiveness to e-learning. The scholars have studied what make a groupwork, but a question remains about whether Group Work Effectiveness can moderate and has an effect on e-learning adoption, more specifically on MOOCs. Based on this, the researcher formulated the following questions:

**RQ 4:** Is the relationship between Performance Expectancy and Behavioral Intention moderated by Group Work Effectiveness?

**RQ 5:** Is the relationship between Effort Expectancy and Behavioral Intention moderated by Group Work Effectiveness?

**RQ 6:** Is the relationship between Social Influence and Behavioral Intention moderated by Group Work Effectiveness?

**Table 8 Concepts and References about Collective Intelligence and Transactive Memory System**

Concepts	References
<b>Collective intelligence</b>	<p>(Wooley, Aggarwal &amp; Malone, 2015), (Woolley, et al., 2010), (Glenn, 2013), (Ilgen, Hollenbeck &amp;Jundt, 2005), (Larson, 2010), (Stokes, 1983), (De Dreu&amp;Weingart, 2003), (Edmondson, 1999), (Ozer and Benet-Martinez, 2006) , (Mount et al., 1998), (Nye, Orel, and Kochergina, 2013), (Triandis, Kurowski, and Gelfand, 1994), (Milliken and Martins, 1996), (Jehn et al., 1999), (Harrison and Klein, 2007), (Van Knippenberg and Shippers, 2007), (Hall, 1978), (Halpern, 1992), (Kimura, 1992), (Witelson, 1976), (Horwitz and Horwitz, 2007), (Martins et al., 2012), (Lu, Chen, Huang and Chien, 2015), (Gruenfeld et al., 1996) , (Hamilton et al., 2003), (Jackson, 1992), (Mello and Ruckes, 2006), (Nemeth, 1986), (Richard, 2000), (Analytis et al., 2017), (Santos et al., 2012), (Yun et al., 2011), (Liker and Bokony, 2009), (Page, 2014), (Conradt et al., 2013), (Jönsson et al., 2015) , (Krause et al., 2011), (Lorenz et al., 2011), (Mavrodiev et al., 2013), (Tump et al., 2018)</p> <p>(Byrne, 1971), (Schneider and Goldstein, 1995), (Tajfel, 1981), (Hinsz et al., 1997) , (Harrison and Klein , 2007), (Milliken and Martin, 1996) (Pelled, 1996), (Tsui, Egan, and O’Reilly 1992), (Williams and O’Reilly, 1998), (Jehn, Northcraft, and Neale, 1999), (Mannix and Neale, 2005), (Medin, Bennis and Chandler, 2010), (Aggarwal et al., 2015)</p> <p>(Mannix and Neale, 2005), (Aggarwal et al., 2015), (Larson, 2010), (Hansen, Owan and Pan, 2006)</p>

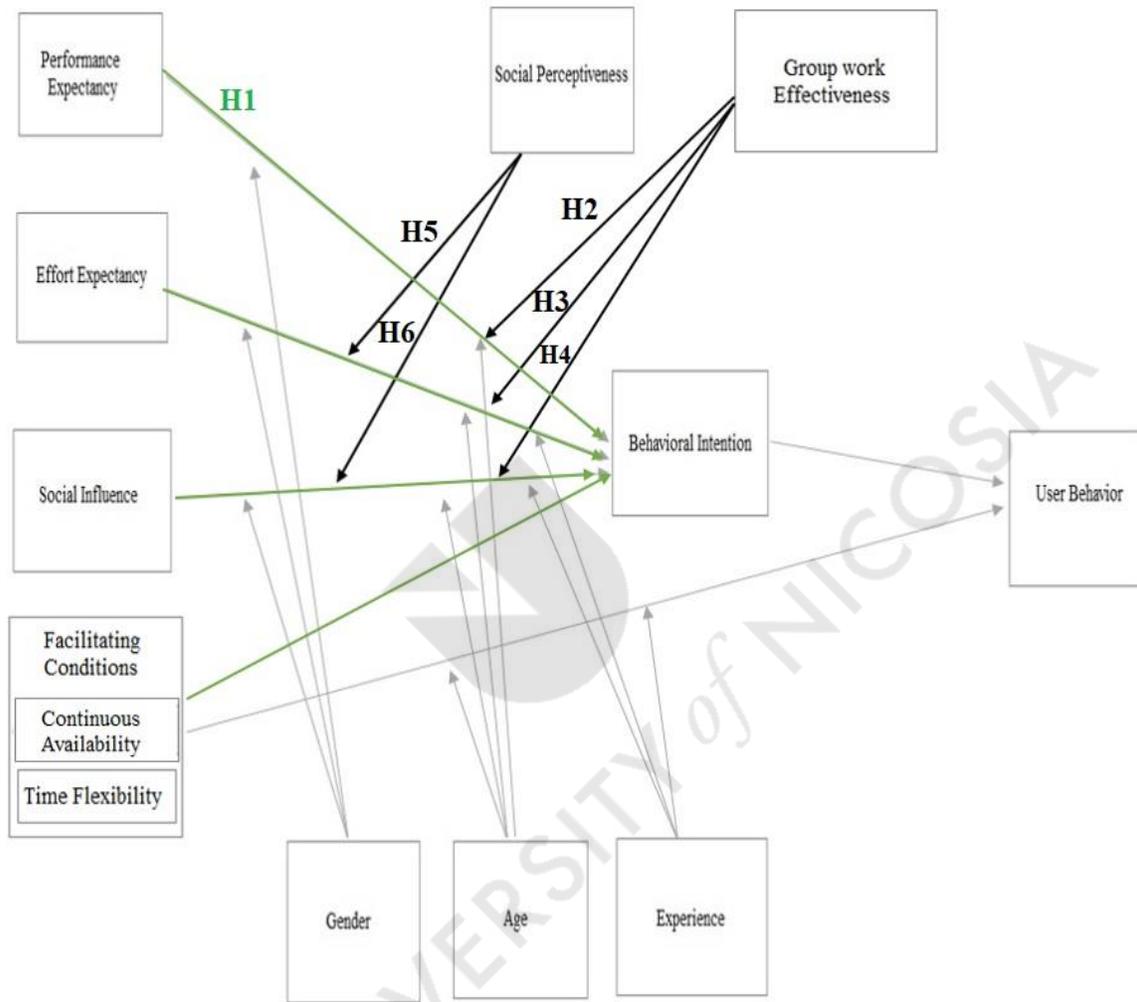
<b>Transactive Memory System</b>	(Wegner, 1987), (Brandon and Hollingshead, 2004), (Kush, 2019), Wegner, Giuliano, and Hertel (1985), (Wegne, Erber, and Raymond, 1991), (Lewis, 2003), (Hollingshead, 2001)  (Levine and Moreland, 1999), (Moreland, 1999), (Wegner et al., 1991), (Hollingshead, 2004), (Littlepage et al., 2008), (Michaelsen, Watson and Black, 1989), (Tindale and Larson, 1992), (Littlepage, 2008).
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## 2.8 Conceptual Model Based on the Literature Gap

In the context of the above mentioned, the proposed conceptual model adopted from the UTAUT model by (Venkatesh, et al., 2003) is depicted in Figure 6.



**Figure 7 Conceptual Model**



## 2.9 Research Hypotheses

### 2.9.1 Presentation of the Hypotheses

Based on the review of literature above, a new conceptual model, an extension to the original UTAUT, was proposed to investigate the effect of certain independent variable, mainly Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions on learners' behavioral intention to attend MOOCs; the research will also study the effect of Social Perceptiveness and Group Work Effectiveness as moderators for these relationships between the

independent variables (Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions) and dependent variable (Behavioral Intention to attend MOOCs).

### 2.8.1.1 Hypothesis one: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions and Behavioral Intention to attend MOOCs

The first hypothesis aims to test the existence and degree of relationship magnitude between the independent variables Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions and the dependent variable Behavioral Intention to use MOOCs.

**Table 9 UTAUT’s constructs: Definitions, type of scale, number of items in each factor and sources. (Source researcher’s own work)**

Factors	Type	Factor Measurement Definitions in the context of this research	Items	Adapted from the Following Sources
Performance Expectancy (PE)	Independent 7 point-Likert scale	Belief that the use of a particular technology will be advantageous or performance enhancing to the individual.	5	Venkatesh et al. (2003)
Effort Expectancy (EE)	Independent 7 point-Likert scale	EE is a belief that the use of a particular technology will be easy and effortless.	5	Venkatesh et al. (2003)
Social Influence (SI)	Independent 7 point-Likert scale	SI comprises the ways in which individuals change their behavior to meet the demands of a social environment.	5	Venkatesh et al. (2003)
Facilitating conditions (FC)	Independent 7 point-Likert scale	FC is an organizational and technical infrastructure supporting	10	Venkatesh et al. (2003)

		the use of acquired systems in their contexts.		
Behavioral Intention (BI)	Independent 7 point-Likert scale	BI is an individual intention to use a particular technology that directly affects actual usage	3	Venkatesh et al. (2003)

Current research has shown that performance expectancy, effort expectancy, social influence and facilitating conditions have significant effects on intention to use e-learning systems (Wang, et al., 2009) (Pynoo, et al., 2011) (Tan, 2013) (Dulle, 2015) (Decman, 2015).

Performance Expectancy is defined as the belief that the use of a particular technology will be advantageous or performance enhancing to the individual (Venkatesh et al., 2003). This research study adopts this definition of Performance Expectancy.

Moreover, MOOCs enable the users (the learners) to attend the course anytime, regardless of where they live, and they are able to access the available information free-of-charge and through one medium, the internet (Gulati, 2013). PE factor is equivalent to Perceived Usefulness (PU) in the Technology Acceptance Model (TAM) (Venkatesh et al., 2003). In previous studies, PE has been proved to significantly affect the behavioral intention to use certain applications in the context of m-commerce (Chong, 2013), mobile internet (Venkatesh et al., 2012).

As for Effort Expectancy, it is defined as a belief that the use of a particular technology will be easy and effortless (Venkatesh et al., 2003), and this research adopts this definition. Using MOOCs is easy. Moreover, Effort Expectancy is equivalent to Perceived Ease of Use in Technology Acceptance Model (TAM) (Venkatesh et al., 2003). Effort Expectancy is proven in previous studies to be a vital factor on the technology acceptance, where the degree of the ease of use of the technology system affected significantly the behavioral intention of various technologies, (Chong, 2013).

SI comprises the ways in which individuals change their behavior to meet the demands of a social environment (Venkatesh et al., 2003), and this research adopts this definition. Moreover, SI is equivalent to subjective norm in the Theory of Reason Action and Theory of Planned Behavior, where it is an important factor that affects the adoption of a system (Venkatesh et al., 2003). Many researchers have come to agree with these findings (Tan, 2013) (Dulle, 2015). MOOCs are not a mandatory technology, in other words, the users of MOOCs have a free choice when resorting to using them, and social influence has an ability in affecting them.

Chong (2013) stated that SI is a significant predictor of the consumers' behavioral intention to use m-commerce; according to (Zhenghao, et al., 2015), Social Influence has a direct effect on behavioral intention to use a particular technology.

As for Facilitating Conditions, it is defined as an organizational and technical infrastructure supporting the use of acquired systems in their contexts (Venkatesh et al., 2003), and this research adopts this definition. If the consumers have the necessary support and resources, they will have the intention to use a technology (Venkatesh et al., 2012). Chong (2013) applied the UTAUT model to investigate the mobile-commerce (m-commerce) adoption, and the study found that facilitating conditions had a significant influence on the user behavior intention to use m-commerce.

The UTAUT model proposed that Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions have a direct influence on behavioral intention to use a particular technology, so in line with theory and the findings from (Wang, et al., 2009) (Pynoo, et al., 2011) (Decman, 2015), the following hypothesis is proposed

**H1: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions will positively affect Behavioral Intentions to attend MOOCs.**

### **2.8.1.2 Hypothesis two: Moderating Impact of Group Work Effectiveness on Performance Expectancy and Behavioral Intention**

According to Ekblaw (2016), group work and learning through projects in online learning are considered as valuable tools for education as they teach teamwork, improves group dynamics and helps learner reach a deeper level of understanding for the course while also fostering a higher level of cognitive abilities.

Connectivism as a learning theory (Siemens, 2005) believes that interaction, dialogue and working in teams in the online environment would often accomplish seeking and constructing knowledge. It is important to try to create, even if online, learning environments that promote and encourage group work, group connectivity and collaboration experiences since this can be very helpful for learners to get the required skills and effectively participate in learning groups and social networks. The question that arises is whether this Group Work Effectiveness can have an effect on the acceptance of e-learning, more specifically MOOCs. Thus, the following hypothesis is proposed:

**H2: The relationship between Performance Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between PE and BI.**

### **2.8.1.3 Hypothesis three: Moderating Impact of Group Work Effectiveness on Effort Expectancy and Behavioral Intention**

A significant relationship between effort expectancy and user intention to adopt a certain technology exists, and this is proven by several studies. Wan, et al (2020)'s research concluded that among the crucial predictors of learners' intention to use MOOCs is Effort Expectancy. In other studies, Effort Expectancy is reported not to have any effect. For instance, Effort Expectancy is reported not to have any prediction effect on teacher's usage of MOOCs (Tsenga, et al., 2019).

Zhou et al. (2010) demonstrated that users who feel that the technology they are using is easy to use will have better chances to adopt this technology. Moreover, other scholars talked about the importance of working in groups (Cheung & Vogel, 2013). Thus, the following hypothesis is proposed:

**H3: The relationship between Effort Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between EE and BI.**

#### **2.8.1.4 Hypothesis four: Moderating Impact of Group Work Effectiveness on Social Influence and Behavioral Intention**

Many studies have demonstrated that SI has a positive effects on users' behavioral intention to use and adopt a certain technology (Venkatesh, et al., 2003) (Tan, 2013) (Dulle, 2015). In other words, on one hand, many users are influenced by the opinion of people who matter for them and how these people see a certain technology. On the other hand, and according to Cheung & Vogel (2013), working in groups is very important especially when the group work proves to be effective. Thus, the following hypothesis is proposed:

**H4: The relationship between Social Influence and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between SI and BI.**

#### **2.8.1.5 Hypothesis five: Moderating Impact of Social Perceptiveness on Effort Expectancy and Behavioral Intention**

Recently, Emotional Intelligence and all its components have been widely studied. Hejase et al. (2021) conducted a cross-multiple relationships studies between EI and different concepts in an attempt to discover possible theoretical links that can help people and organizations benefit as they implement EI in organizations. Moreover, Social Perceptiveness as one form related to emotional intelligence and related to 'Theory of mind' or 'ToM' is about a person's ability to use certain mental states and concepts such as beliefs, emotions, goals etc. for the purpose of predicting and interpreting behavior (Westra & Carruthers, 2018).

A growing number of studies have been focusing on studying the importance of the individuals' ability to infer about others' mental states (Engel, et al., 2014). Thus, hypotheses H5 and H6 are formulated:

**H5: The relationship between Effort Expectancy and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between EE and BI.**

**2.8.1.6 Hypothesis six: Moderating Impact of Social Perceptiveness on Social Influence and Behavioral Intention**

**H6: The relationship between Social Influence and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between SI and BI.**

**2.9.2 Conclusion of the Hypotheses**

Based on the literature review and the gaps identified in it as well as the inconclusive findings reported by the many studies about e-learning in a professional setting and MOOCs in particular, a conceptual model is formulated by the researcher and is hereby presented in Figure 6 above.

**2.9.3 Research Question**

Based on the literature review, and after the formulation of the hypotheses, the research question formulated is:

“To what extent can Social Perceptiveness and Group Work Effectiveness affect E-learning adoption among professionals in the case of MOOCs users? And what would the conceptual model for adoption be like?”

Below is a table (Table 10) that summarized the hypotheses:

**Table 10 Formulated Hypotheses to be tested**

H #	Relationship to be studied	Formulation of the hypothesis
H <sub>1</sub>	States that there is a relationship between Performance expectancy, effort expectancy, social influence, Facilitating	Performance expectancy, effort expectancy, social influence and Facilitating Conditions will positively affect behavioral intentions to attend MOOCs.

	Conditions and the behavioral intentions to attend MOOCs.	
H <sub>2</sub>	States that there is a moderating impact of Group Work Effectiveness on the relationship between Performance Expectancy and Users' Behavioral Intention to attend MOOCs	The relationship between Performance Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between PE and BI.
H <sub>3</sub>	States that there is a moderating impact of Group Work Effectiveness on the relationship between Effort Expectancy and the Behavioral intention of learners to attend MOOCs	The relationship between Effort Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between EE and BI.
H <sub>4</sub>	States that there is a moderating impact of Group Work Effectiveness on the relationship between Social Influence and the Behavioral intention of learners to attend MOOCs	The relationship between Social Influence and the Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between SI and BI.
H <sub>5</sub>	States that there is a moderating impact of Social Perceptiveness on the relationship between Effort Expectancy and the behavioral intention to attend MOOCs	The relationship between Effort Expectancy and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between EE and BI.

H <sub>6</sub>	States that there is a moderating impact of Social Perceptiveness on the relationship between Social Influence and the behavioral intention to attend MOOCs	The relationship between Social Influence and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between SI and BI.
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## 2.10 Conclusion

This chapter of the dissertation is divided into several parts. It starts with an introduction to give the reader a glimpse of what the chapter will be about then the rest of the parts focus on some main topics and concepts that are of interest and how they were presented in other scholars' research. The second section of the chapter shed light of e-learning in the professional setting. It gives the definitions according to several scholars, then it tackles e-learning and training and development and continues with e-learning and lifelong learning for professionals.

The chapter then continues with another section about the learning theories especially the constructivism and connectivism approach, then parts about MOOCs, Social Perceptiveness, Group work Effectiveness. The chapter then presents the conceptual model based on the literature gap and then hypotheses are presented.

## **Chapter Three- Research Methodology**

### **3.1 Introduction**

In this chapter, the researcher attempts to explain and justify the methodological foundation of this research as well as to explain the processes, collect data and analyze them within the researcher lenses of this thesis. Chapter three starts by defining the research nature and purpose and then examines the different types of philosophical positioning and how they differ according to the different schools of thoughts. Then the chapter explains in details the philosophical positioning pertaining to this specific research. Part of this chapter is dedicated to the research design focusing on the research choice and the research strategies. Moreover, in this chapter, the researcher also explains the experiments' protocol since a test was conducted as a form of experiment. Moreover, detailed information is provided about the reliability and validity of the tool used in the data collection process. Furthermore, a section is dedicated to the data collection and how primary data collection is collected. Finally, the chapter examines the characteristics of the sample selected, the software adopted for data analysis, and the statistical techniques and ways of analysis chosen.

### **3.2 Research Framework and Purpose**

The purpose of this research is mainly exploratory; it aims to seek and understand the factors that affect the adoption of e-learning. Exploratory research is characterized by flexibility. It allows the researcher to change the focus and the direction of the research whenever new insights and data arise, and this is very helpful since it allows for a gradual narrowing of the research focus as it progresses (Adams and Schvaneveldt, 1991; Saunders et al., 2007). This research's exploratory purpose especially with the extensive literature review enabled the identification of the research theoretical gap, and thus the need for the development of a new theory.

### **3.3 Philosophical Positioning**

The philosophy and methodology used by the researcher are at the base of any research. As a result, research is expected to consist of

- Ontology
- Epistemology
- And methodology

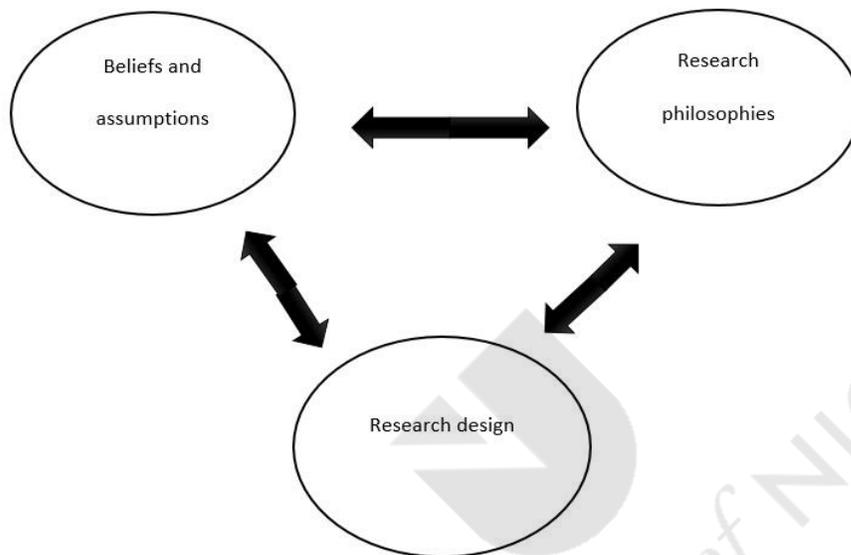
The paragraph below is a summary of the philosophical positing of this specific research, and detailed explanation will follow in the rest of the paragraphs.

The researcher identifies with both subjectivism and objectivism. On one hand, the researcher believes in the view of subjectivism especially the one related to individuals' reality being constructed by social interaction. As human beings, we are always interpreting not only the world around us but also the actions of the people with whom we interact. Reality, seen differently by each one of us, is under constant change because of our interpretations of the world and our interactions with people around us. These interpretations lead to changes in our own actions, and this in turn, leads to changes in our understanding of the complex social situations. However, the researcher also identifies with the objectivism view and that interaction between individuals follows a plan where timing is of utmost importance, a plan that people cannot always control. It is true that reality is constructed through social interaction, but this interaction is chaotic; yet you can still find a certain order in this chaos allowing for objective and quantifiable ways to measure the world and any property occurring within it. This shows a similarity between the researcher's view of how the world operates, what is reality and how knowledge is developed, and the arguments of the pragmatist approach that claim that it is possible to work with both objectivism and subjectivism and that the research question is the most important thing that determines the adopted research philosophy. Add to this, the multidisciplinary nature of this research topic necessitates the use of mixed methods, that's why the researcher will use pragmatism as an approach while the adopting critical realistic ontology. The advantage of critical realism is that it can give the mixed methods a certain "perspective that emphasizes diversity and the relationships among people, events, and ideas. This allows for process-based causal inferences" (Baker, 2016, p. 330).

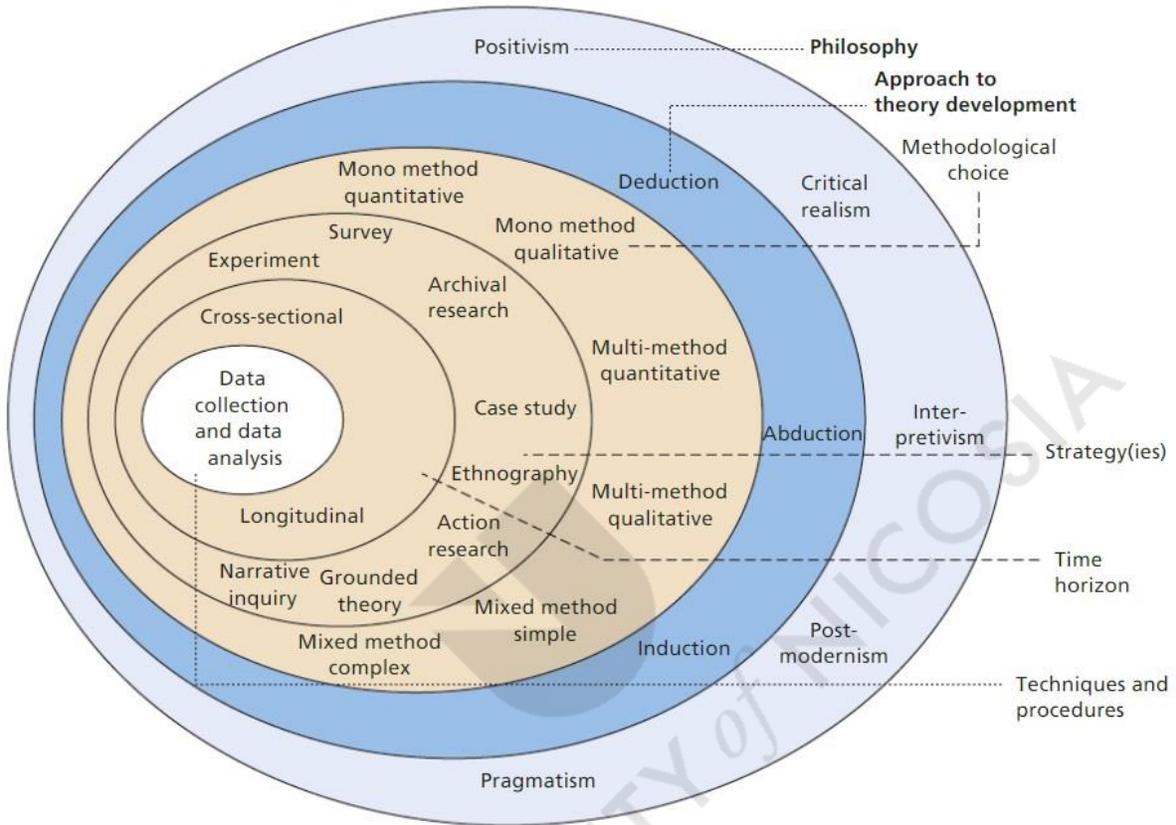
To elaborate more, the research philosophy refers to "*a system of beliefs and assumptions about the development of knowledge*" (Saunders, et al., 2016, p. 124). It is through the research that the researcher is investigating knowledge and developing it in a certain field. Each research starts from some sort of personal assumptions where the researcher reflects on his/her understanding of reality, the world and knowledge – 'in veritat e triumpho'. It is therefore important for the researcher to think about and choose his/her own philosophical approach to knowledge, as a first step towards developing the research.

The figure below (Figure 7), summarizes how research is formed. The researcher would think about his/her own beliefs and link them to the different types of philosophies set forth, and to the design that will be undertaken in the research.

**Figure 8 Developing a research philosophy as a reflexive process. Source Bristow and Saunders (2015)**



**Figure 9 The research "Onion" taken from (Saunders, Lewis, & Thornhill, 2016)**

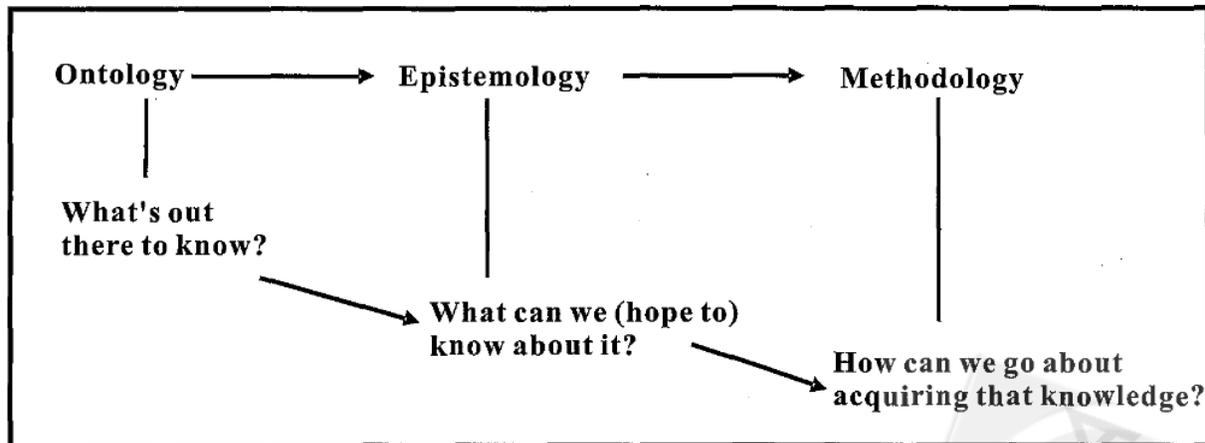


The 'Research Onion' (Figure 8) that was first designed by Saunders et al. (2007), draws the steps to be followed when a researcher is developing his/her research strategy. Each of the onion's layers represents a stage of the process to be followed, beginning from the outside to the center. These are the steps through which the researcher needs to pass in to have an effective methodology. The philosophy forms the first layer and thus is the starting point of any research and the pillar of any subsequent approach which forms the second layer.

According to May (2011), the type of knowledge that will be investigated affects the choice of the philosophy that will be used in the research. A research philosophy starts by specifying both the ontology and epistemology that will be followed. Ontology and epistemology as concepts are interdependent. Once the ontology that will be used is specified then the epistemology will be automatically chosen. In fact, Blaikie (1993) described ontology as the science of the being. It is through ontology that the question “what is reality?” is answered. Is reality subjective or objective? Ontology is about the assumptions regarding how the world works; in other words, it attempts to answer the question of what the nature of the world is.

Epistemology is the other branch of philosophy. It answers the question “How do we know about this reality?” It is the justification of what can be considered as knowledge. In other words, it is the criterion that differentiates between what can be considered as knowledge and what can be considered as belief. Knowledge to some researchers is not questionable because it can be proven through scientific means. However, things are different to others because the nature of knowledge to them is different and this is because the data collected is more subjective. Researchers need to specify their epistemological stance in any research or in any claim to knowledge (see Figure 9 below).

**Figure 10 Ontology, Epistemology and Methodology: A Directional Dependence (Taken from Hay, 2002:63)**



Epistemology and ontology can be assessed as an objectivist or a subjectivist perspective. It is these two concepts that legitimize the ways of doing research and determine what is valid and acceptable (Coghlan & Brannick, 2014).

The objectivist view on epistemology accepts the idea that it is possible to objectively access the external world. The subjectivist rejects this theory. The objectivist view of ontology states that the social and natural reality have an independent existence and are totally free, whereas the subjectivist view of ontology believes that what we call reality is not independent, but rather dependent (Johnson & Duberley, 2000).

Subjectivism is a continual process of social interaction where social phenomena are constantly under revision. Subjectivism is associated with the term constructionism, or social constructionism, which follows from the interpretivist position. Interpretivism as an epistemological stance believes that people perceive situations in different ways according to their own views of the world and that reality is shaped by these different ways. Knowledge depends on subjectivity and the findings of the research are results of the subjective understanding of the perceived reality.

This approach believes that you cannot measure something without changing it. To interpretivist, humans are different from physical phenomena because they create meanings, and they attempt to

study. They think that human beings and social worlds should be studied differently than physical phenomena, since people with their different cultures and backgrounds at different times and circumstances create different meanings. The researcher in this approach attempts to understand the subjective reality of the individuals under study to capture the rich complexity of social situations. The researcher uses personal research structure rather than structural framework. He/she comes to the research field with some prior knowledge but not enough to develop a final design, mainly because of role of the unpredictable reality. Some might argue that the researcher's personal involvement in the data collection process is unavoidable, and therefore, the generalization of the research findings becomes difficult. Most of the times the researcher uses qualitative methods of data collection although quantitative methods may also be employed.

In contrast, Objectivism, followed by the positivist approach to research, believes that social entities exist externally to the researcher, and therefore, the world should only be measured in an objective manner (Bailey, 1996). As a positivist, the researcher tries to remain neutral and detached from the research and the data that would be usually measurable and quantifiable (Saunders, et al., 2016). The researcher adopting this approach is detached from the setting of the research. The aim is to find knowledge and generalize the findings that would be purely validated by logic and consistency of prediction. In relation to this, Remenyi et al. (1998, p. 33) note that "*the researcher is independent of and neither affects nor is affected by the subject of the research*".

In other words, this approach states that an external reality exists, and that the researcher is independent and value-free. According to the positivist approach, you can obtain reliable data only through phenomena that can be observed. Positivism claims that true knowledge is based only on facts (Comte, 1953); it works with a socially observable reality to deduce law-like generalizations focusing on finding facts that are observable and measurable. In this manner, positivists aim for the development of law-like generalizations, while they maintain an external position to the data collection process (Remenyi, et al., 1998). The researcher would be looking in his/her data for causal relationships to produce those law-like generalizations. So causal explanation and prediction are the positivism's contribution while maintaining an objective stance and being detached and neutral of what the researcher is researching.

Therefore, in contrast to the interpretivist, the positivist approach is concerned with facts rather than impressions. For these reasons, scholars who favor this approach employ quantitative

methods for the collection and analyses of data, while emphasis is given to quantifiable observations that can be statistically analyzed.

Pragmatism is among the leading approaches. According to the pragmatism philosophy, concepts are relevant only if they support action. Researchers who follow this philosophy believe that one cannot get the entire picture from a single point of view. There could be several realities. However, this does not necessarily mean that they always use several methods. Their purpose is to gather credible, relevant and reliable data whether through a method or several methods. To them, the research question is what determines the research philosophy, and thus they can use multiple research methods. For instance, they can combine qualitative, quantitative and action research as long as they can find answers to the research question.

Another approach is Critical Realism. To Johnson & Duberley, this approach's essence is that the truth is what the senses show us as reality. Reality is independent from the human mind. It adopts a subjectivist epistemology similar to the constructivism but objectivist ontology like the positivism.

Critical realists see reality as independent and external; however, this reality cannot be directly accessed by observation and knowledge about it, but rather through sensations and not through the actual things observed. Critical realist researchers tend to believe in the need to look at the bigger picture of which only a small part is seen. Their research focuses on finding explanations for organizational events by looking for root causes and mechanisms through which the organizational life is shaped. And because of this focus, the research takes the form of social and organizational structured in-depth historical analyses and their transformational change over time (Reed, 2005).

Critical realism supports the point that quantitative and qualitative research do not rule out the other; they can work together, and this will help address their limitations (Maxwell & Mittapalli, 2010). The goal of critical realist research is to measure and verify underlying structures in reality (Bisman, 2010).

### **3.4 Research Design**

The function of a research design is to ensure that the evidence obtained enables the researcher to effectively address the research problem as clearly as possible. The research design is concerned

with the overall plan of the research (Robson, 2002). It includes two important decisions: The research choice and the research strategies which are related to the research questions and the general plan of how the researcher will address them. The choices for the current thesis are consistent with its philosophical positioning, and they are based on the main research question and its sub-questions as well as the research objectives. Research design is like maps and architectural blueprints that guide the construction. Saunders, Lewis, & Thornhill (2016) have nicely explained the research design through the concept of Research Onion, as discussed above, and in which the process occurs in layer (see Figure 8 above).

### **3.4.1 Research Choice**

The research choice is about the way of choosing techniques and procedures for the collection of data and its analysis by the researcher and whether to choose quantitative, qualitative or both for the collection process (Saunders et al., 2007). The single technique is used in the mono-method to collect and analyze data, whereas more than one technique are used in multiple methods to answer the research question(s). Scholars believe that the choice of multiple methods is increasing due to being an advocated choice among business and management research (Curran & Blackburn, 2001).

This thesis will be using multiple methods because of several reasons, mainly because of the nature and purpose of the research, the main research questions and the related sub-questions formulated in relation to the main question. The research methods and strategies aim to help the researcher meet the clear research questions and the research objectives (Smith, 1975; Saunders et al., 2007), and by choosing the multiple methods there will be a better chance to answer the main research question and meet its objectives. Add to this, multiple methods help achieve a better evaluation of the findings and to what extent they can be credible since these methods use more than one data collection technique and analysis procedures, thus combining quantitative and qualitative techniques and procedures is not possible. Mixed methods allow the use of different research methods: both quantitative and qualitative data collection and analysis are used according to different purposes in the study while enabling triangulation (Saunders et al., 2007; Tashakkori and Teddlie, 2010).

Mixed methods research is a rising methodological choice for many academics and researchers from across a variety of disciplines. The growth of mixed methods research is led by a discussion

over the justification for combining what has been previously regarded as incompatible methodologies. As Teddlie and Tashakkori (2010) argue, mixed methods research has been established as a third methodological movement, complementing the existing traditions of quantitative and qualitative movements (Greene, 2007); (Tashakkori & Teddlie, 2010); (Teddlie & Tashakkori, 2010). A comprehensive definition is given by Creswell and Plano Clark (2007, p. 5) who define mixed methods research as

*A research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone.*

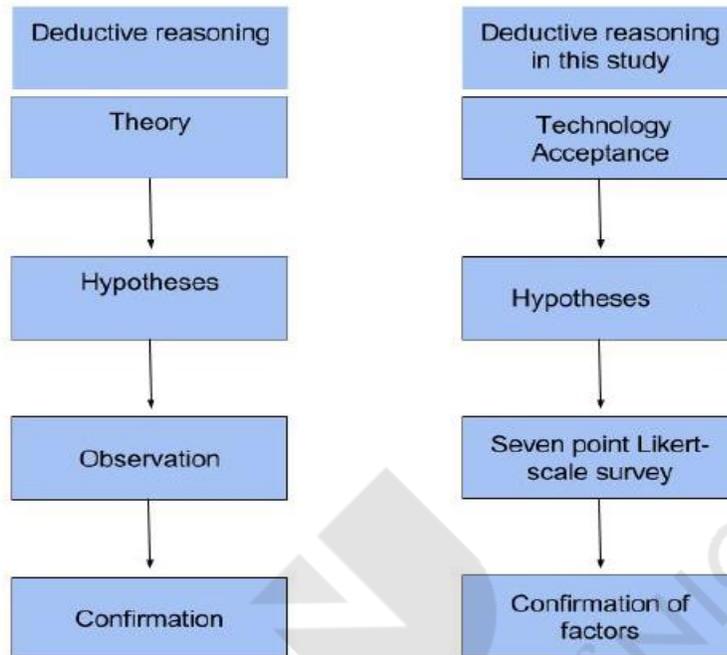
Mixed-method research and mixed-model research fall under the category of mixed methods. In mixed-method research, quantitative and qualitative data collection techniques and analysis procedures can be used either at the same time or sequentially, but cannot be combined. In this specific research, the multi-purpose and multi-disciplinary nature required a multi-method quantitative.

### **3.4.2 Research Strategies**

The two main research approaches are deductive and inductive. In the deductive approach, the research will be testing hypotheses that were generated based on a theory and each hypothesis will be either supported or rejected. So, a theory testing will be conducted after adopting an existing theory as a basis (Saunders et al., 2009).

This research follows the deductive reasoning (depicted below in Figure 10), which involves the developing of the research model based on theories. In the case of this research, technology acceptance theories and previous research is used to generate the research model and hypotheses. This study will test the proposed hypotheses, by collecting data using a questionnaire and an experiment, and then data will be analyzed to confirm or reject the postulated hypotheses.

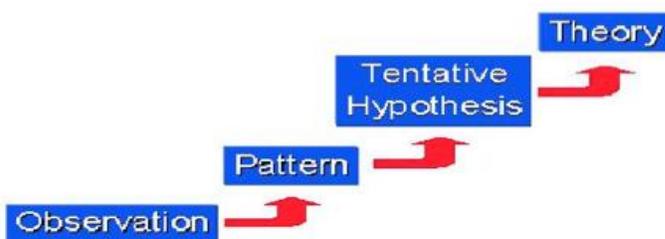
**Figure 11 Research Deductive Reasoning of this Thesis**



Source Author's own work based on Saunders et al. (2019)

The induction reasoning is an approach where the researcher will start with a group of observations and then move from the particularity of these experiences to generalize with a set of propositions about those experiences, and based on these observations, the researcher will be able to construct supported relationships and even to generalize and generate a theory (Gray, 2008). Scholars believe that in order to ensure high reliability, it is recommended to take multiple cases or observations. Moreover, Inductive logic places an emphasis on arguing from particular things to general (Creswell and Plano Clark, 2007). The inductive process (see figure 11 below) can be described as follows: a) observations, b) pattern c) tentative hypothesis and d) theory (Brymand and Bell, 2007).

**Figure 12 Research Inductive Reasoning**



Source: Saunders et al. (2019)

### **3.4.3 Justification for the Selection of the Research Method**

The researcher is following the multi-method quantitative. Many reasons pushed the researcher to use this method in this thesis. First, the nature and purpose of the research, and add to this the main research questions and the related sub-questions formulated in relation to the main question. As mentioned earlier, the aim of the research methods is to help the researcher answer the clear research questions and meet the research objectives (Smith, 1975; Saunders et al., 2007), and the this method will yield a better chance to answer the main research question and meet its objectives. It will provide data in case one data may be insufficient. Therefore using more than one data collection technique and analysis procedure can help the researcher to achieve a better evaluation of the findings, explain the initial results. It enhances the research with a second method. Mixed methods permit the use of both quantitative and qualitative data collection and analysis and according to different purposes in the research while enabling triangulation (Saunders et al., 2007; Tashakkori and Teddlie, 2010). Moreover, using mixed methods will help the researcher to generalize exploratory findings, and best employ a theoretical stance as well as understanding the research objectives through multiple research phases.

The researcher used the UTAUT model as a base for the conceptual model that was created. The UTAUT model seems a suitable model to follow since the researcher is investigating Technology acceptance among users and in this thesis, the technology under investigation is e-learning, specifically the MOOCs to see the effect of certain factors on users, and in this research, the users are learners who attend MOOCs and who are professionals. Their choice of attending MOOCs was not mandatory and their choices were based on individual personal reasons. The model investigates the behavioral intentions of users and examines the factors that may influence the decision to attend

those courses, and this is relevant to the case of this research. The research develops and empirically tests a model in an attempt to predict factors affecting learners' behavioral intentions to attend MOOCs. It explores the behavioral intentions to attend MOOCs from the perspective and point of view of learners who are professionals deliberately choosing to attend a MOOC. This is done by applying the Unified Theory of Acceptance and Use of Technology (UTAUT) model with the addition of Social Perceptiveness and Group Work Effectiveness as moderating factors. The researcher chose the UTAUT model, because since its introduction, the model has been applied and tested extensively to predict system usage and make technology-adoption related decisions and understand factors (Zhou, et al., 2010); (Venkatesh & Zhang, 2010); (Chang, 2012).

### **3.5 Experiment's Protocol**

As for the participants in this research, the researcher will be addressing a group of professionals located in different places in the world and who are or have been enrolled in a MOOC. The research was conducted with 253 participants to ensure a high level of accuracy and reliability. After conducting the experiment "Reading the Mind in the Eyes" which is a test that can help predict the social perceptiveness of the respondents and thus identify their emotional intelligence to a certain degree, participants then continued a questionnaire based on the UTAUT forms of questionnaire to investigate their degree of adoption of MOOCs being a form of e-learning.

The framework of the research was as follows:

- 1- The experiment on Emotional Intelligence,
- 2- Investigating participants' technology acceptance and adoption,
- 3- Investigating their perception about group Work Effectiveness as a form of Collective Intelligence.

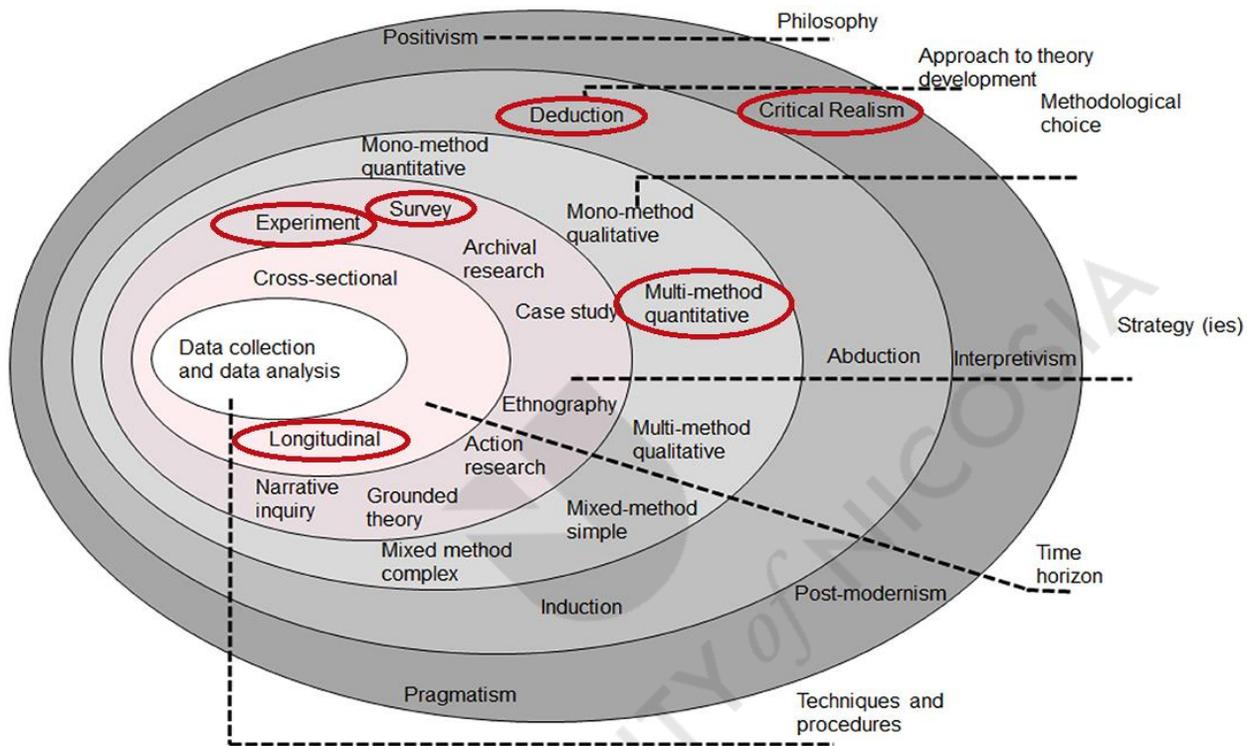
The researcher conducted the experiment with the aim of measuring emotional intelligence and what degree of social perceptiveness respondents have. This will be done through using the Reading the Mind in the Eyes Test (Baron-Cohen, et al., 1997).

The second part would test how much their adoption and acceptance of MOOCs and attending MOOCs can be predicted. With a conceptual model based on the UTAUT model and its independent factors, in addition to using novel proposed moderators to test their effect on these

relationships, while also extending one of the original independent variables, the Facilitating Conditions, by adding two sub-constructs: Continuous Availability and Time Flexibility.

Below (Figure 12) is the research onion of this specific research.

**Figure 13 The research onion of this specific research, adapted from Saunders et al. (2007)**



This research seeks to achieve the following objectives:

R.O.1 – Perform an extensive literature review on the relevant cognitive areas of e-learning, continuous education, Social Perceptiveness, Group Work Effectiveness and e-learning adoption theories.

R.O.2 – Explore indicators related to e-learning adoption with regards to various aspects of Emotional Intelligence and Collective Intelligence, more precisely Social Perceptiveness and Group Work Effectiveness.

R.O.3 – Frame the methodological processes that will help to address the main research questions that are listed below.

R.O.4 – Perform experiments using an e-learning platform with a group of professionals.

R.O.5 – Design and develop a model based on e-learning adoption with and extension of an already-existing variable (Facilitating Conditions) and with Social Perceptiveness, Group Work Effectiveness as moderators

Thus, this study attempts to answer six research questions listed below:

RQ1: To what extent do Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions affect the behavioral intentions of learners to attend MOOCs?

RQ 2: What effect does Social Perceptiveness have on the relationship between Effort Expectancy and Behavioral Intention of learners to attend MOOCs?

RQ 3: What effect does Social Perceptiveness have on the relationship between Social Influence and Behavioral Intention of learners to attend MOOCs?

RQ 4: What effect does Group Work Effectiveness have on the relationship between Performance Expectancy and Behavioral Intention of learners to attend MOOCs?

RQ 5: What effect does Group Work Effectiveness have on the relationship between Effort Expectancy and Behavioral Intention of learners to attend MOOCs?

RQ 6: What effect does Group Work Effectiveness have on the relationship between Social Influence and Behavioral Intention of learners to attend MOOCs?

Table 11 aligns the research questions and objectives with the research strategies and techniques employed for data collection.

**Table 11 Main Research Question, Research Objectives, Research Strategies and Techniques**

MAIN RESEARCH QUESTION	SPECIFIC RESEARCH QUESTIONS	RESEARCH OBJECTIVES	RESEARCH MODE OF EXPLORATION
<p>“To what extent can Social Perceptiveness and Group Work Effectiveness affect the E-learning adoption among professionals?”</p>	<p>RQ1: To what extent do Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions affect the behavioral intentions of learners to attend MOOCs?                      RQ 2: What effect does Social Perceptiveness have on the relationship between Effort Expectancy and Behavioral Intention of learners to attend MOOCs?                      RQ 3: What effect does Social Perceptiveness have on the relationship between Social Influence and Behavioral Intention</p>	<p>R.O.1 – Perform an extensive literature review on the relevant cognitive areas of e-learning, continuous education, Social Perceptiveness, Group Work Effectiveness e-learning and MOOCs adoption theories.                      R.O.2 – Explore indicators related to e-learning adoption with regards to various aspects of Emotional Intelligence and Collective Intelligence, more precisely Social Perceptiveness and Group Work Effectiveness.                      R.O.3 – Frame the methodological processes that will</p>	<p>➤ Secondary Data Collection / Literature Review</p> <p>➤ Experiments</p>

	<p>of learners to attend MOOCs?</p> <p>RQ 4: What effect does Group Work Effectiveness have on the relationship between Performance Expectancy and Behavioral Intention of learners to attend MOOCs?</p> <p>RQ 5: What effect does Group Work Effectiveness have on the relationship between Effort Expectancy and Behavioral Intention of learners to attend MOOCs?</p> <p>RQ 6: What effect does Group Work Effectiveness have on the relationship between Social Influence and Behavioral Intention of learners to attend MOOCs?</p>	<p>help to address the main research questions that we have listed below.</p> <p>R.O.4 – Perform experiments using an e-learning platform with a group of professionals.</p> <p>R.O.5 – Design and develop a model based on e-learning adoption with and extension of an already-existing variable (Facilitating conditions) and with Social Perceptiveness, Group Work Effectiveness as moderators.</p>	
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### 3.6 Quantitative Research

Quantitative research uses objective measurements and statistical and or numerical analysis of the data collected through questionnaires. The focus is to gather this numerical data, analyze it and generalize the results across a population for the purpose of explaining a certain phenomenon. It uses models, hypotheses and theories to explain relationships among variables (Saunders et al., 2009). A quantitative research can be helpful when it comes to fulfilling the purpose of a research and can enable accuracy and analysis of a large numerical data. According to Johnson & Christensen (2014), the quantitative research can also generalize the research findings, and it is useful for testing and validating theories about why phenomena occur. The quantitative research method is used in this research to test the proposed research model and to examine the relationships between the dependent variable, which is the behavioral intention to attend MOOCs and the following independent variables, PE, EE, SI, FC that was extended to focus on specific conditions. The model will also test the moderating effect of the Social Perceptiveness and Group Work Effectiveness on the relationship between the Dependent variable and several of the independent variables. A questionnaire in Google Forms will help collect the quantitative data that will be analyzed through SPSS (Statistical Package for Social Sciences). The statistical results will determine the rejection or acceptance of the proposed hypotheses.

Some of the factors of the proposed research model were taken from previous research and adapted to the context of Attending MOOCs as an example of e-learning adoption. The table below (Table 12) shows the adopted operational definitions to the context of this study with corresponding references to the pertinent literature.

**Table 12 Operationalization of UTAUT**

Factors	Type	Factor Measurement Definitions in the context of this research	Items	Adapted from the Following Sources
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Performance Expectancy (PE)	Independent 7 point-Likert scale	Belief that the use of a particular technology will be advantageous or performance enhancing to the individual.	5	Venkatesh et al. (2003)
Effort Expectancy (EE)	Independent 7 point-Likert scale	EE is a belief that the use of a particular technology will be easy and effortless.	5	Venkatesh et al. (2003)
Social Influence (SI)	Independent 7 point-Likert scale	SI comprises the ways in which individuals change their behavior to meet the demands of a social environment.	5	Venkatesh et al. (2003)
Facilitating conditions (FC)	Independent 7 point-Likert scale	FC is an organizational and technical infrastructure supporting the use of acquired systems in their contexts.	10	Venkatesh et al. (2003)
Fear of Technological Advances (FOTA)	Independent 7 point-Likert scale	FOTA is the fear or dislike of advanced technology or complex devices, especially computers.	3	Venkatesh et al. (2003)
Perceived privacy, Security & Trust (PPST)	Independent 7 point-Likert scale	PPST is the online privacy usually connected with information privacy and therefore is described as Internet users' concerns regarding their ability to control the collection of	7	Venkatesh et al. (2003)

		their personal information, as well as to control the future usage of the collected information or the information that was generated based on their online activities.		
Behavioral Intention (BI)	Independent 7 point-Likert scale	BI is an individual intention to use a particular technology that directly affects actual usage	3	Venkatesh et al. (2003)
User Behavior (UB)	Independent 7 point-Likert scale	UB investigates the adoption MOOCs by the users.	3	(Venkatesh et al., 2012)
Social Perceptiveness	Independent 7 point-Likert scale	Investigates how MOOCs users perceive the effect of their social perceptiveness on their MOOCs experience	6	Researcher's own work
Group Work Effectiveness	Independent 7 point-Likert scale	Investigates how MOOCs users perceive the effectiveness of working in working in groups when it comes to MOOCs adoption	5	Researcher's own work
Reading the Mind in the Eyes	Graded over 36 with 2-point Likert Scale	A test developed by professor Simon Baron-Cohen at the University of Cambridge to test	36	(Baron-Cohen, et al., 1997),

	(Correct/wrong as an answer)	social perceptiveness through set of eyes that describe feelings		
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Source: Researcher's Own work

### 3.7 Survey Design

Before collecting data, and as an important step that precedes collection, this research dedicated enough time to design and test the questionnaires, a step which is frequently “under discussed, underused, and underreported” Prescott and Soeken (1989) (p. 60). In fact, many scholars described the importance of answering or designing a survey, and how it must be given high priority especially when there are data collection and information processing that will be systematically analyzed (Tourangeau et al., 2000; Aday, 2006). Below is a description of this important stage prior to conducting the collection of questionnaires and administering the experiment.

According to Braekman et al. (2019), self-administered questionnaires (SAQ) are of great importance. In the case of this thesis, and to successfully collect all the data that would be analyzed and used to test the experiments results, questionnaires were used while respecting specific criteria. The first thing that needed to be prioritized is the comprehension of the questions. With well-structured scale item questions, processing would be straight forward. Thus, a sequential design process can be more effective than the concurrent design. In this context, the questions or statements should have a smooth flow from one variable to another, which will result in better responses from people especially when the study is conducted online (Millar and Dillman, 2011; Mauz et al., 2018).

At the time of distribution of questionnaires and the administration of the experiments, the world was fighting the spread of the COVID-19 pandemic with many countries forcing partial or total lockdowns, so it was decided that both questionnaires and experiments would be conducted online especially since the topic is about e-learning so paper-pen and face to face activities were ruled out and everything was conducted online. So, all sharing of data between the researcher and the respondents was done remotely and online without compromising in any step of the

communication process since this is reported to have a positive effect on the response rate. The researcher contacted the respondents through emails, posts on social media platforms and messages on the main page of their e-learning courses which was in line with what Foddy (1993) reported about the importance of creating a smooth communication process to have successful study since this will create better understanding of the questionnaire, and thus raises the chances of having higher response rate and better answers.

Many scholars also emphasized the importance of focusing on the research question, aims and hypotheses while developing and building the questionnaire (Vikat et al., 2007), and this exactly what the researcher did: put the research questions and hypotheses as the starting points to design the questionnaires and decide on the experiments to be conducted.

In the below section, a summary of some major points that were taken into consideration as the questionnaires was designed.

### **3.7.1 Length of Questions**

Holbrook, Cho and Johnson (2006) reported for a survey and questionnaire to be successful, it should be concise and built with consistency as this will increase not only the response rate but also the accuracy of these responses since, they will be easier to grasp.

Dillamn (2000) and Fink (2003) also stressed the importance of the survey's total length in number of questions or total number of pages presented to the potential respondents.

This research took these recommendations into consideration and thus tried to put only the relevant and necessary statements in the shortest version possible without compromising the accuracy of the questionnaire. As Oppenheim's (1992) advises, most of the statements respected the 20 words at most for every sentence for any item scale in a questionnaire presented in English.

### **3.7.2 Design of the Questions**

Question order, structure, length and most importantly question wording are very important to have a well-designed questionnaire (Brace, 2004). These guidelines were followed in this research in addition to avoiding any misinterpretation that could also affect the answers of respondents, especially if they misunderstand the purpose of the question (DeLeeuw and DeHeer, 2002). In this research, and to avoid any misunderstanding, the researcher provided a glossary with definitions for most of the terms that might be considered confusing for some respondents.

In addition to all of the above, the researcher made sure in the question design stage that none of the statements in the questionnaire would be created with a pre-determined response to avoid influencing the respondents as this would be result in biased responses.

### **3.7.3 Grammar and Context**

It is important for any well-designed survey to be grammatically correct and keeping grammatical structure complexity at its minimum (Dillman, 2000). Thus the statements used simple English taking into consideration that the majority of the respondents might not have English as their first language, so language as being a potential barrier was also taken into consideration.

### **3.7.4 Double Barreled Questions or statements**

Ambiguity was avoided and question clarity was improved as vague questions were avoided. According to Brace (2004), 'double-barreled' questions are the questions that can carry double meanings or can have different interpretations from respondents thus creating ambiguity. The researcher tried her best not to fall into this mistake. At the same time and as Spector (1997) recommended, reversed questions were also included to make sure that the respondents were engaged and aware of the topic which would allow a better measurement of correlation among the statements in each set.

### **3.7.5 Specificity, Simplicity and Question Order**

Several scholars have emphasized the fact that, to eliminate respondents' cognitive lead in a questionnaire, the best way would be through the simplicity of the questions (White et al., 2005). Survey questions must be specific and straight to the point. And that's why, according to Martin (2002), if the questions are complex, they must be divided and adjusted to become straight to the point. According to Dillmann (2000), a good questionnaire or survey must avoid any kind of vagueness, and this can be done by avoiding words such as 'perhaps' and 'maybe' thus avoiding the use of misleading questions and the decreased anxiety associated with misunderstanding of the statements or questions in the survey or questionnaire.

## **3.8 Data Collection**

According to Hox & Boeije (2005), data collection involves the gathering of both primary and secondary data. Primary data is the gathering of first-hand data for a specific research goal whether through experiments, questionnaires, interviews, observations and focus groups. Once reused by other researchers as a basis for their own research, this data becomes secondary data. Secondary data is defined as “*preexisting data that was originally collected for a different research purpose or by someone other than the researcher*” (Given, 2007, p. 803). In this research, the researcher will use both secondary and primary data collection

### **3.8.1 Secondary Data Collection**

As mentioned above, secondary data is data taken from other researchers and from existing information such as published books, articles, internet search engines etc. There are many advantages for collecting secondary data. One advantage is that it saves the researcher time and money since he/she will be using existing information. Another major advantage is that it helps the researcher by serving as a guide on how to conduct the research (Saunders et al., 2003). However, the researcher should be ware because one of the main disadvantages of using secondary data is that these data can be irrelevant or no longer valid since they were collected for another study with different objectives, or very old, and thus may not a complete fit for the current problem that the researcher is attempting to tackle (Ghuri et al., 1995).

In this research, a literature review that followed a systematic way was performed, and articles published by other researchers around Technology Acceptance theory, MOOCS, Emotional Intelligence precisely Social Perceptiveness, Collective Intelligence precisely Group Work Effectiveness were used extensively. The purpose was to gather secondary data on the acceptance of technology specifically MOOCs adoption and the external factors that affect the behavioral intention to use technology and attend and finish a MOOC.

EBSCO, Elsevier's Scopus, and Google scholar were used to gather the secondary data, which is in form of reports, peer reviewed articles in journals, articles and reports in high caliber websites and books.

### **3.8.2 Primary Data Collection**

Primary data are first-hand information data collected for the goal of the specific research project that is being investigated (Saunders et al., 2009). Primary data can be collected through observation, interviews, or the use of questionnaires (Saunders et al., 2009) or records written and

preserved by people who witnessed a certain event or who were directly involved in it (Burns, 2000).

For this research, primary data were gathered through a questionnaire that was administered online through Google Forms on actual MOOCs users who were enrolled at the time the research was conducted or who had completed one or more MOOCs in the past.

### 3.8.3 Sample Size

As this research investigates the factors that affect the behavioral intention to adopt and attend MOOCs, the population of this research will be MOOCs users who are currently enrolled or have enrolled in a MOOC. The population is assumed to be large, but due to time and money limitations it would not be possible to gather data from the whole population sampling should be applied (Saunders et al., 2012). In this situation, Smith (2013) states that the sample size can be calculated by the saturation formula shown below; this formula calculates an ideally necessary sample size. By definition, saturation is “*The point in the data collection where no new or relevant information emerges, hence the researcher looks at this as the point at which no more data need to be collected*” (Given, 2008, p. 196).

Standard deviation, confidence level and margin of error will be used in order to calculate the ideal size and decide on the sample size. The standard deviation is 0.5 as it ensures that the sample is relatively large enough (Smith, 2013). As for confidence level, the most common confidence levels in research are 90%, 95% and 99% (Smith, 2013). In this study the assumed confidence level is 95%. The Z-score at 95% confidence level is 1.96. It is suggested that the sample size should be larger than 30 in order to ensure that the sampling distribution for the mean is normally distributed (Saunders et al., 2007). Since the population is recognized to be large, researchers suggest that the sample could be in some reasonable error range. The researcher, and due to time and money constrains will stick to the necessary sample size making sure it is met. Hence, the selected margin of error is +/- 6% knowing that the acceptable margin of error is between +/- 4% and +/- 8% (Medina & Portilla, 2015). After entering the numbers into the formula below, it suggests that the sample size is approximately 250 respondents.

Necessary Sample Size =  $(Z\text{-score})^2 * Std\ Dev*(1\text{-StdDev}) / (\text{margin of error})^2$

$$= (1.96)^2 * (0.5) * (0.5) / (+/- 0.06)^2$$
$$= 250$$

### **3.8.4 Questionnaire**

According to Saunders et al. (2009), questionnaires are appropriate ways to collect data in the case of explanatory research. “The questionnaire is a measurement instrument, whose purpose is to operationalize the researchers’ information demand into a format which allows for statistical measurement” (Brancato, Macchia, Murgia, Signore, Simeoni, Blanke, & Hoffmeyer-Zlotnik, 2006, p.2).

In the introduction section of this research questionnaire, the researcher explained the aim and objective of the research being part of an academic research, and that all answers and any personal information shared by the respondents are to be held in strict confidentiality and will be used only for the purposes of this academic research. The results will be reported in aggregate form only, and the respondents will never be identified individually. For this research, the questionnaires were sent using Google Forms platform and respondents responded online where they had to fill in the questionnaires that was sent either by email or posted on social media platforms mainly Twitter and Facebook. The distribution started in March 2021 and continued for 2 months until we received a fair number of completed forms that enable the researcher to move further with the analysis of the findings. Receiving the forms started on 6/3/2021 and the form stopped accepting responses on 16/5/2021. The respondents gave their electronic consent to participate in the research and 254 responses were gathered.

To elaborate more, the questionnaire in this research is divided into 13 different sections, and the used statements were adopted from scholarly and academic works. These sections can be grouped into two parts: one part about social perceptiveness, and the second part related to Technology acceptance, specifically MOOCs adoption.

The first section was an introductory paragraph to introduce the aim and purpose of this questionnaire, then a second part presenting the demographic variable such as gender, age, experience, place of birth of the respondents, without any reference to identifying factors such as name.

After a small introduction explaining the aims of the survey and its purpose, the second section started as mentioned before with the presentation of the demographic variables such as gender, age category, education, etc. Section 3 was an experiment done through the questionnaire to test social perceptiveness through what is called “Reading the Mind in the Eyes RME Test”, a test that was developed by Professor Simon Baron-Cohen at the University of Cambridge. The respondent needs to choose one option in each question: for each set of eyes, the respondent was asked to choose which word best describes what the person in the picture is thinking or feeling. Even if they feel that more than one word is applicable, the respondents will have to choose just one word, the word which he/she considers to be more suitable. The researcher provided a definition of the adjectives that describe each photo in case a respondent needed the definition of one or more of these words. This part was graded, and each correct answer would grant the respondent one grade.

The second part, sections 4 to 14, tested technology acceptance relating to the variables tested in the original UTAUT model. Each group of scale statements measure one variable, and this was derived from a specific scholar’s work who tested and validated and used that group.

For a questionnaire to be valid and to ensure the content validity, it is highly recommended to adapt the items or the survey questions from previous studies (Luarn & Lin, 2005). In this questionnaire, 35 items were adapted from past studies and amended to fit the context of this research as Table 13 below shows, with references to the literature they were adopted from.

**Table 13 Statements and Reference to Literature**

Questionnaire section/ Statements	Reference to Literature
PE1: I would find MOOCs useful for my career or job. PE2: Attending MOOCs facilitates the accomplishment of tasks more quickly. PE3: Attending MOOCs enhances productivity. PE4: I would attend MOOCs again. PE5: I would find using MOOCs advantageous amid the COVID-19 pandemic	Performance Expectancy (PE) (Venkatesh et al., 2012)
EE1: I find it easy to attend MOOCs	Effort Expectancy (EE)

<p>EE2: The interaction with MOOCs is easy for me.</p> <p>EE3: The process of learning through MOOCs is easy for me.</p> <p>EE4: I would find MOOCs easy for me to use</p> <p>EE5: It is easy to use MOOCs and stay safe from COVID-19</p>	<p>(Venkatesh et al., 2012)</p>
<p>SI1: The majority of my family use MOOCs.</p> <p>SI2: Colleagues who are important to me believe that I should attend MOOCs.</p> <p>SI3: The majority of my friends attend MOOCs.</p> <p>SI4: People who have an impact on my behavior think that I should attend MOOCs.</p> <p>SI5: One of my family members/friends/colleagues has recommended that I should attend MOOCs.</p>	<p>Social Influence (SI) (Venkatesh et al., 2012)</p>
<p>FC1: I have the resources (laptops, smartphones, etc.) necessary to attend MOOCs and get support on all levels.</p> <p>FC2: I have the necessary knowledge to attend MOOCs and get support on all levels.</p> <p>FC3: Attending MOOCs is not compatible with my platform.</p> <p>FC4: If I have some difficulties with a MOOC, support is available for assistance.</p> <p>FC5: Support for MOOCs is easy to get.</p> <p>FC6: MOOCs availability on a 24/7 basis is truly appreciated.</p> <p>FC7: Time Flexibility in attending MOOCs makes it very helpful.</p> <p>FC8: The minimum time constraint in attending MOOCs is very helpful.</p> <p>FC9: Continuous accessibility to MOOCs is very helpful.</p> <p>FC10: It is very helpful to access MOOCs anytime.</p>	<p>Facilitating conditions (FC) (Venkatesh et al., 2012)</p>
<p>FOTA1: I am worried about the rapid advances in MOOCs.</p> <p>FOTA2: I am not comfortable with the trends in technological advancement of MOOCs.</p>	<p>Fear of Technological Advances (FOTA) (Venkatesh et al., 2012)</p>

<p>FOTA3: I am feeling anxious about attending MOOCs since the outbreak of COVID-19.</p>	
<p>PPST1: I trust MOOCs.</p> <p>PPST2: I believe that attending MOOCs is trustworthy.</p> <p>PPST3: I do not doubt the honesty of MOOCs' participants.</p> <p>PPST4: Attending MOOCs has the ability to fulfill my informational needs.</p> <p>PPST5: The chances of losing control over my personal information is high when attending MOOCs.</p> <p>PPST6: I think attending MOOCs could lead to the exposure of my personal information.</p> <p>PPST7: Attending MOOCs would reduce the privacy of my personal information.</p>	<p>Perceived privacy, Security &amp; Trust (PPST) (Venkatesh et al., 2012)</p>
<p>BI1: Assuming I have access to MOOCs, I intend to use it.</p> <p>BI2: Given that I had access to MOOCs I predict that I would use it.</p> <p>BI3: I plan to attend MOOCs in the future.</p>	<p>Behavioral Intention (BI) (Venkatesh et al., 2012)</p>
<p>UB1: I have attended at least one MOOC within the last 6 months.</p> <p>UB2: I haven't attended any MOOCs</p> <p>UB3: I attend MOOCs frequently.</p>	<p>User Behavior (UB) (Venkatesh et al., 2012)</p>
<p>SP1: My perceptiveness of how the rest of the learners were advancing helped me in the way I was advancing in the MOOCs</p> <p>SP2: My sensitivity and understanding of others' perspectives helped me to advance in MOOCs</p>	<p>Social Perceptiveness (SP) (author's own work)</p>

<p>SP3: My ability to listen well and be attentive to emotional cues in real life played a role in my advance in MOOCs.</p> <p>SP4: Because I seek mutual understanding and welcome sharing of information, MOOCs' experience was successful for me.</p> <p>SP5: Because I show concern for others' needs, advancing in MOOCs was not difficult</p> <p>SP6: My ability to recognize my own strengths and weaknesses made advancing in MOOCs easier.</p>	
<p>GWE1: Being aware of what people in the MOOCs were doing helps me in relation to making proper choices regarding my E-learning experience.</p> <p>GWE2: Getting support from people in the MOOCs makes me resolve issues easier</p> <p>GWE3: People in the MOOCs are able to work through differences of opinion without damaging the outcomes.</p> <p>GWE4: I would get a better outcome if I work alone in MOOCs.</p>	<p>Group Work Effectiveness (author's own work)</p>
<p>36 photos about eyes, each set of eyes has 4 words among which only one describes how the person in the photo feels</p>	<p>Reading the Mind in the Eyes Test (Baron-Cohen, et al., 1997)</p>

### 3.9 Quantitative Data Analysis - Descriptive and inferential statistics

The quantitative data gathered through surveys are analyzed through two main methods: the descriptive and the inferential statistics (Saunders et al., 2009). Through the descriptive statistics, the researcher will be able to summarize the data and “*provide another context, a richer picture or enhanced representation in which to examine the phenomenon of interested*” (Given, 2008, p. 209). The descriptive statistics on one hand will be used in this research to analyze and try to get a better understanding about the behavioral intention of the MOOCs' users and be able to visualize the sample collected in the questionnaire.

Inferential statistics on the other hand allows the researcher to test hypotheses and use the data to make inferences about the population based on the sample (Geisler, 2004). In this research, inferential statistics will be used for the purpose of making conclusions based on the hypotheses testing and for this end, the statistical analysis software SPSS will be used to make the analysis in this research.

### **3.10 Reliability and validity**

According to Holme & Solvang (1996), the goodness of data can be measured in terms of reliability and validity.

#### **3.10.1 Reliability**

Reliability is defined as the consistency, and repeatability of the collected and analyzed data (Given, 2008). When checking for the reliability of the data collected, it is important to ask these three questions:

1. Will these measures give the same results on different occasions?
2. Will other researchers reach similar observations?
3. Is there transparency in how much sense was made out the raw data? (Easterby-Smith et al., 2008)

The Cronbach's alpha test is used to verify the reliability of the instrument used to collect the data. Cronbach's alpha is a common method used for measuring internal consistency and reliability of the data (Saunders et al., 2009), in other words, it describes the "extent to which all the items in a test measure the same construct and hence it is connected to the interrelatedness of the items within the test" (Tavakol & Dennic, 2011, p.53). For this purpose, this research will use Cronbach's alpha to test the reliability of the data collected.

Cronbach's alpha is measured as a number between 0 and 1, and it is commonly believed that for an acceptable value, Cronbach's alpha should be above 0.7, while values below 0.7 are not satisfactory (Tavakol & Dennic, 2011; George & Mallery, 2003).

#### **3.10.2 Validity**

The initial model design has been verified and validated. This verification and validation is achieved through three forms of validity: the content, the construct and the criterion validity.

The Content validity that measures the coherency of the items that are to be tested. For the validity of the questionnaire, it is important to check the content validity or “the extent to which the measurement questions in the questionnaire, provide adequate coverage of the investigative questions” (Saunders et al.,2009, p. 373). In this research, the survey questions for the investigated factors were taken from previous studies that have been successful in proving the factors significant to ensure content validity.

Conducting a pilot test is a must before collecting data because it will allow the researcher to be sure that the respondents will not encounter any problems while answering the survey questions and increasing the likelihood that the data collection process will go smooth (Saunders et al., 2009). In the case of this research, a pilot study was conducted with 21 respondents prior to questionnaire releasing and based on the evaluation of those respondents, the researcher added some definitions for some key words since the respondents in the pilot test found some difficulty understanding the intended meaning of some words.

The Construct validity or the degree to which inferences can be made from the operationalization of a construct. It demonstrates experimentally that a test is measuring the construct it claims to be measuring. Pallant (2007) emphasized the importance of testing the derived hypotheses.

The Criterion validity or the extent to which an operationalization of a construct predicts a theoretical representation of the construct- the criterion. It assesses the relationship of the tested items, and this ensures that the validation of the hypotheses results is successful. According to Brown (2001) the predictive validity concept is very important as it focuses on the degree of correlation among the variables of the same factor.

### **3.11 Pearson Correlation Analysis**

Before starting the analysis and before doing the simple or multiple regression analysis, it is important to make sure that the collected data does not suffer from multicollinearity (Pallant, 2007). According to Hew et al. (2015), Multicollinearity is a problem, and it occurs when there is highly correlated independent factors with one another and this will make it difficult to understand which independent factors affect the dependent factor. This research will use the Pearson Correlation Analysis to determine if the data suffers from any multicollinearity. Add to this, the

independent variables should show some relationship with the dependent variable in order to do a multiple regression analysis (Pallant, 2007), and this can be checked using the Pearson Correlation Analysis.

### **3.12 Simple Linear Regression**

Simple Linear regressions will be conducted first to individually test the relationship of each independent variable with the dependent variable; however, this will not be the only test since in the case of this researcher, there are several independent variables that might be affecting a dependent variable, thus a multiple linear regression will be performed too.

### **3.13 Multiple Linear Regression**

One of the statistical tools used to investigate the quantitative relationship between variables is the multiple linear regression; it can prove the existence of a relationship between the independent and dependent variables (Sykes, 1993). Moreover, the analysis of Multiple linear regressions “*is the technique that enables additional factors to enter the analysis separately so that the effect of each independent variable can be estimated. It is valuable for quantifying the impact of various simultaneous influences upon a single dependent variable*” (Sykes, 1993, p. 8). According to Hankins, French & Horne (2000), technology acceptance models can be tested with multiple linear Regression analysis since it can help discover the influence of more than one independent variables on one dependent variable.

In this research, multiple linear regression analysis will be used since it enables the analysis of many independent variables’ effect on the dependent variable, this type of regression analysis will be used to examine the factors in the proposed research model, using the SPSS software.

### **3.14 Conclusion**

In this chapter, the researcher justifies the methodological foundation of this research. Then processes are explained. The chapter starts with a definition of the nature of the research its purpose. It also investigates the different types of philosophical positioning. It then explains the research philosophical positioning. The research design is then explained with a focus on the research choice and the research strategies. Furthermore, the experiments’ protocol is then explained and detailed information is provided about the reliability and validity of the tools used in the data collection process. Moreover, the chapter gives details about the data collection and

how the primary data collection was collected. The chapter is then concluded with examining the characteristics of the sample selected, the software adopted for data analysis, and the statistical techniques and ways of analysis chosen.



## **Chapter Four- Research Findings and Analysis**

### **4.1 Introduction**

This chapter presents the findings along with the quantitative data analysis. First, the researcher will present the descriptive analysis followed by the reliability and validity analysis in addition to presenting and portraying the results of correlation and multiple linear regression analyses, and then the chapter will be end by reporting the results of the hypotheses testing.

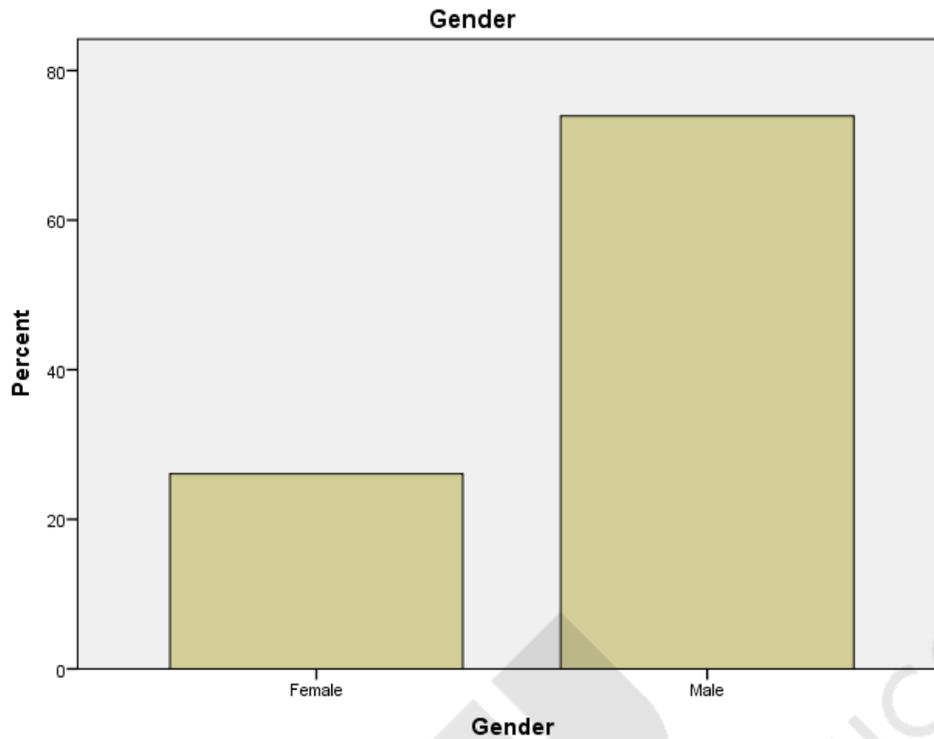
### **4.2 Descriptive Analysis**

A descriptive analysis is used to calculate the frequency of the demographic information of the respondents collected through the questionnaire, such as age, gender, place of residence and the work experience of the participants who filled the questionnaire. This will help the researcher have a better understanding of those people who responded and who are using or have used MOOCs. Descriptive statistics summarize the information in a collection of data (Agresti & Finlay, 2009).

This research focuses mainly on the following factors or characteristics with demographic nature: age, gender, place of residence and number of years of experience.

An overall of 253 completed responses were gathered with 73.9% males and 26.1% females as Figure 13 below shows.

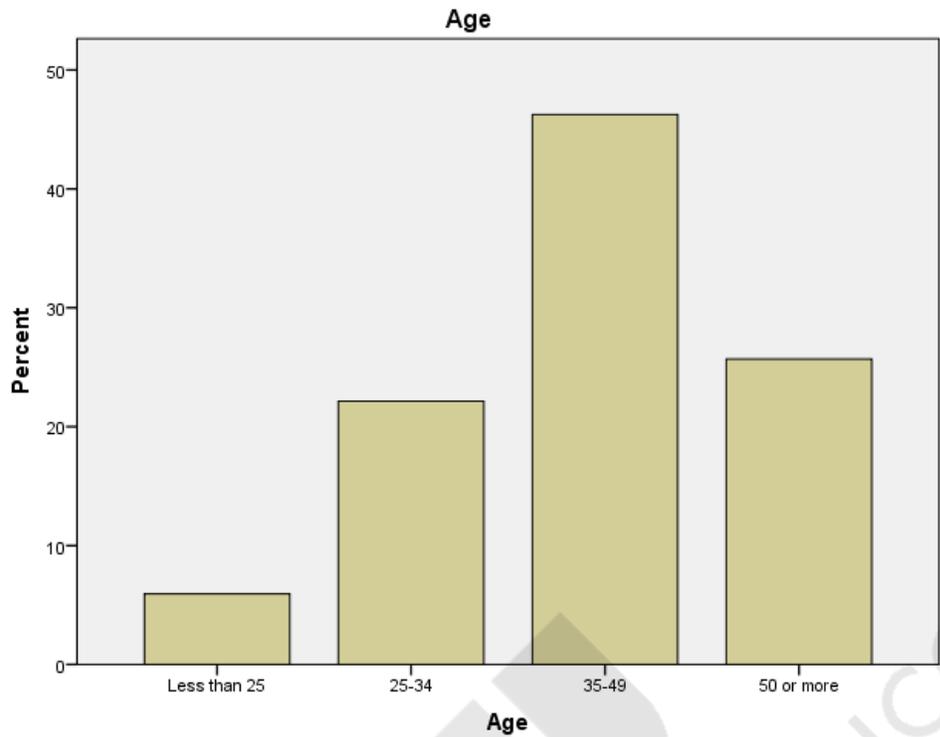
**Figure 14 Gender Distribution**



The number of males being much higher than that of females made the researcher investigate the matter further and found that indeed, and according to the Wall Street Journal, the number of males who register and attend MOOCs is larger than that of women (Fowler, 2013). According to an article published in ICEF Monitor in 2014, this gender imbalance increases in certain domains of study in MOOCs, where female participation decreases drastically. Gameel & Wilkins (2019) reported the same findings.

As for the age of the respondents, Figure 14 below visually shows the distribution.

**Figure 15 Age Distribution**



The majority of the respondents is formed of people aged 39-49 with a rate of 46.2%, next is the age group category of 50 or more with 25.7 %, those who are aged 25 to 34 form 22.1% of the population size whereas those who are less than 25 form 5.9% of the sample. Table 15 below shows details and the percentage of age distribution:

**Table 14 Age Distribution**

		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 25	15	5.9	5.9	5.9
	25-34	56	22.1	22.1	28.1
	35-49	117	46.2	46.2	74.3
	50 or more	65	25.7	25.7	100.0
	Total	253	100.0	100.0	

As for the experience in their professions, Table 15 below depicts the years of experience of the respondents. It shows that a majority of 43.1% have 16 or more years of experience, 23.7% have less than 5 years of experience, 18.6% have an experience of 5 to 10 years whereas 14.6% have an experience of 11 to 15 years.

**Table 15 Years of Experience in your Profession**

**Number of years of experience in your profession**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Less than 5	60	23.7	23.7	23.7
5 to 10	47	18.6	18.6	42.3
11 to 15	37	14.6	14.6	56.9
16 or more	109	43.1	43.1	100.0
Total	253	100.0	100.0	

To understand our sample more, a cross-tabulation analysis was performed between gender and the years of experience; the results are below in Table 16:

**Table 16 Gender-Years of Experience Cross-tabulation**

**Number of years of experience in your profession \* Gender Cross-tabulation**

		Gender		Total
		Female	Male	
Less than 5	Count	22	38	60

Number of years of experience in your profession		% within Number of years of experience in your profession	36.7%	63.3%	100.0%
		% within Gender	33.3%	20.3%	23.7%
		% of Total	8.7%	15.0%	23.7%
	5 to 10	Count	15	32	47
		% within Number of years of experience in your profession	31.9%	68.1%	100.0%
		% within Gender	22.7%	17.1%	18.6%
		% of Total	5.9%	12.6%	18.6%
	11 to 15	Count	7	30	37
		% within Number of years of experience in your profession	18.9%	81.1%	100.0%
		% within Gender	10.6%	16.0%	14.6%
		% of Total	2.8%	11.9%	14.6%
	16 or more	Count	22	87	109
	% within Number of years of experience in your profession	20.2%	79.8%	100.0%	
	% within Gender	33.3%	46.5%	43.1%	
	% of Total	8.7%	34.4%	43.1%	
Total	Count	66	187	253	
	% within Number of years of experience in your profession	26.1%	73.9%	100.0%	
	% within Gender	100.0%	100.0%	100.0%	

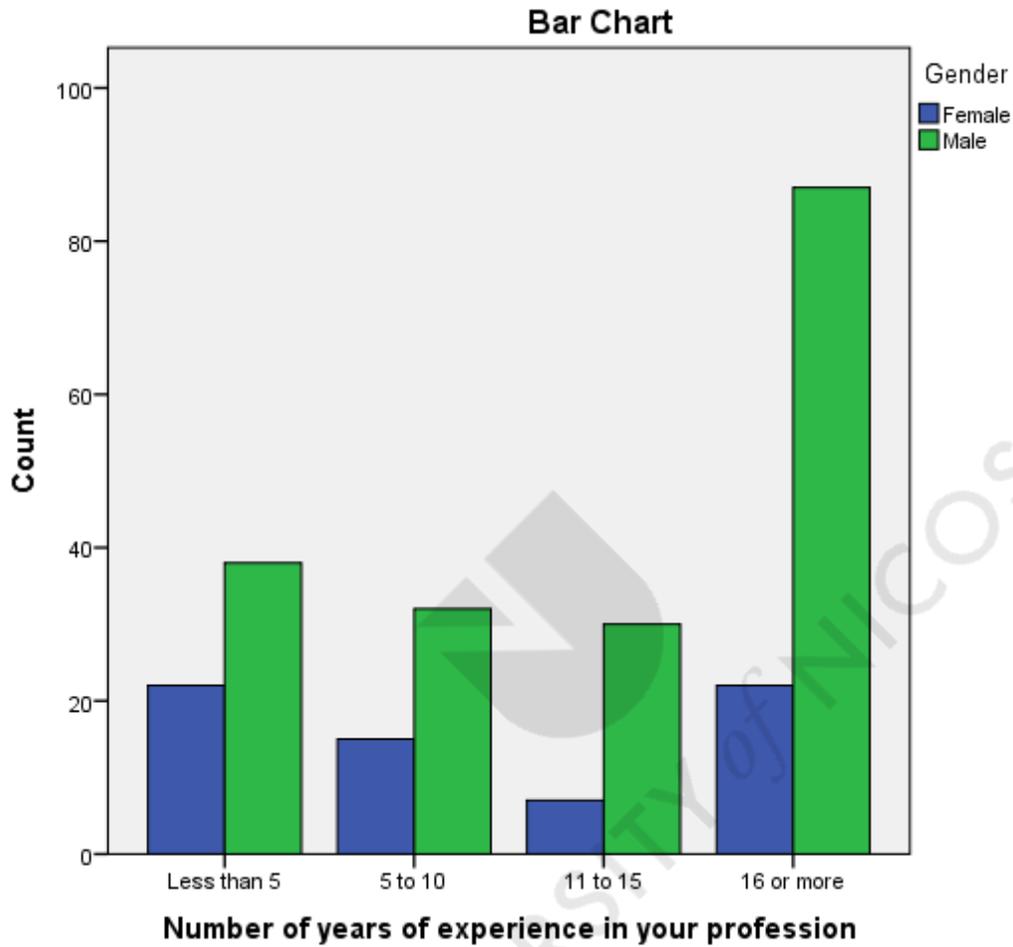
% of Total	26.1%	73.9%	100.0%
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The results of Table 16 show that 33% of the females have an experience of less than 5 years and another 33.3% have an experience of more than 16 years; those who have a work experience of 11-15 years form 10.6% of our sample, whereas 22.7 % of the females in our sample have experience between 5 to 10 years.

On the other hand, 46.5% of the males have an experience of more than 16 years, whereas the rest of the age categories seem to have a close percentages with 20.3% having less than 5 year experience, 16.1% have a work experience of 11-15 years whereas 17.1 % of the males in our sample have experience between 5 to 10 years.

So the majority of whether females or males in the sample are professionals with an experience of more than 16 years in their professions. It is worth noting that the next big percentage of females enrolled in MOOCs are females with less than 5 years of experience who probably think that attending a MOOC can help them advance in their career. The below picture, Figure 13 will help to visually see the distribution and cross tabulation of these two demographic variables.

**Figure 16 Cross-Tabulation between Gender and Years of Experience**



Those respondents are dispersed in several locations and countries. Table 17 below is a table that shows their locations:

**Table 17 Table of Countries of residence**

Italy	44	17.4
France	8	3.2
UK	23	9.1
Greece	70	27.7
Cyprus	25	9.9
Russia	5	2.0

Romania	1	0.4
Switzerland	4	1.6
Germany	24	9.5
South Africa	20	7.9
Netherland	2	0.8
Belgium	1	0.4
Spain	23	9.1
Poland	3	1.2
Total	253	100.0

The respondents seem to come from different countries that are spread over different continents, and based on the numbers, it appears that we have greater representation from Greece and Italy. The researcher expected difficulties in reaching all countries equally because of the constraints of time and lack of budget, and based on how difficult it is to reach and convince people from all over the world to reply, the population seems as diversified as time and lack of budget permits.

**Table 18 Mean Median and Standard Deviation**

		Frequency	Percent
Gender	Female	66	26.1
	Male	187	73.9
	Prefer not to answer		
Age	N		253
	Mean		2.92
	Median		3
	Std. Deviation		0.843
	Minimum		1
	Maximum		4
Professional Experience	less than 5	60	23.7
	5 to 10	47	18.6
	11 to 15	37	14.6
	16 or more	109	43.1

As for the experiment that was conducted by the researcher, it was a test called “Reading the Mind in the Eyes (RME)” which was developed by prof. Simon Baron-Cohen at the University of Cambridge.

As mentioned previously, Social Perceptiveness is related to ‘Theory of Mind’ or ‘ToM’. According to Westra & Carruthers (2018), Theory of Mind is related to a person’s ability to use mental states concepts such as beliefs and emotions to predict and interpret behavior.

Also called “Mentalizing” (Apperly, 2012) or “mind reading” (Heyes, 2014), the Theory of Mind is the ability that helps people make inferences about others’ mental states. According to Engel, et al. (2014), ToM can be reliably measured unlike many abilities that constitute the broad category in Emotional Intelligence. The researcher conducted the Reading the Mind in the Eyes Test as an experiment with the aim of measuring emotional intelligence and what degree of social perceptiveness the respondents have (Baron-Cohen, et al., 1997).

For each set of images of human eyes, the respondent is supposed to choose one word that best describes what the person in the picture is thinking or feeling. Even when he/she might think that more than one word is applicable, the respondent can only choose one, the one he/she thinks is to be most suitable. An example from the “Reading the Mind in the Eyes” test is given below. A copy of the full test can be found in Appendix I.

terrified  
(alarmed, fearful )

upset  
(agitated, worried, uneasy )

2



arrogant  
(important, having a big  
opinion of oneself )

annoyed  
(irritated, displeased )

This test was corrected and graded, where each respondent had a grade for each correct choice of the 36 photos; the grade was over 36 showing the degree of Social Perceptiveness each respondent has. The average of the 253 respondents was 24.40/36 with 9 as the lowest grade and 35 the highest. For each photo, and among the four choices that were given, the highest percent was for respondents who chose the correct choice. The percentages of each answer can be seen in Table 19 below; it came as follows:

**Table 19 Percentages of each answer**

Photo	% of correct answers
Photo 1	66.1
Photo 2	48.0
Photo 3	66.1
Photo 4	79.1
Photo 5	67.7
Photo 6	72.0
Photo 7	50.0
Photo 8	74.0
Photo 9	79.5
Photo 10	59.4
Photo 11	70.1
Photo 12	69.7
Photo 13	68.5
Photo 14	73.2
Photo 15	70.5
Photo 16	74.8
Photo 17	60.2
Photo 18	83.5
Photo 19	57.9
Photo 20	79.9

Photo 21	70.5
Photo 22	78.7
Photo 23	64.2
Photo 24	73.6
Photo 25	43.3
Photo 26	67.3
Photo 27	56.7
Photo 28	66.9
Photo 29	59.4
Photo 30	73.6
Photo 31	59.8
Photo 32	67.3
Photo 33	61.4
Photo 34	57.5
Photo 35	59.8
Photo 36	72.0

Table 20 below shows the respondents' answers to the statements concerning Performance Expectancy (PE). With 1 being Strongly disagree, 2 Disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree, 7 strongly agree, the answers to the statements are as follows:

**Table 20 Statements concerning Performance Expectancy (PE)**

Performance Expectancy (PE)	Strongly disagree	Disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
<b>PE1: I would find MOOCs useful for my career or job.</b>	0.8%	1.6	2.0	5.9	15.8	36.0	37.9
<b>PE2: Attending MOOCs facilitates the accomplishment of tasks more quickly</b>	0.4%	1.6	2.4	21.7	24.5	29.6	19.8
<b>PE3: Attending MOOCs enhances productivity.</b>	0.4%	3.2	4.0	13.8	22.9	32.8	22.9
<b>PE4: I would attend MOOCs again.</b>	0.4%	0.4	0	4.0	10.3	31.6	53.4

<b>PE5: I would find using MOOCs advantageous amid the COVID-19 pandemic</b>	0.8%	1.2	0.4	8.7	7.1	23.7	58.1
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As for the Effort Expectancy, Table 21 below shows the respondents' answers to the statements

**Table 21 Statements concerning Effort Expectancy (EE)**

Effort Expectancy	1	2	3	4	5	6	7
<b>EE1: I find it easy to attend MOOCs</b>	0.4	0.8	4.3	9.1	19.4	33.6	32.4
<b>EE2: The interaction with MOOCs is easy for me</b>	0.8	0.8	4.0	9.5	15.4	34.8	34.8
<b>EE3: The process of learning through MOOCs is easy for me</b>	0.4	0.8	4.0	6.7	18.6	35.2	34.4
<b>EE4: I would find MOOCs easy for me to use</b>	0.4	0.4	2.0	6.3	15.0	40.7	35.2
<b>EE5: It is easy to use MOOCs and stay safe from COVID-19</b>	0.8	0	2.4	7.9	8.7	20.2	60.1

For Social Influence, answers to the statements came as can be seen in Table 22 below:

**Table 22 Statements concerning Social Influence (SI)**

Social Influence	1	2	3	4	5	6	7
<b>SI1: The majority of my family use MOOCs</b>	37.9	24.1	8.3	18.6	7.5	2.0	1.6
<b>SI2: Colleagues who are important to me believe that I should attend MOOCs</b>	13.0	15.8	6.3	36.0	15.8	8.7	4.3
<b>SI3: The majority of my friends attend MOOCs</b>	27.7	21.7	10.3	24.5	8.7	4.7	2.4
<b>SI4: People who have an impact on my behavior think that I should attend MOOCs</b>	13.8	16.6	6.3	32	16.2	9.1	5.9
<b>SI5: One of my family members/friends/colleagues has recommended that I should attend MOOCs</b>	23.3	20.2	5.5	22.5	11.5	10.3	6.7

For Facilitating Conditions, the answers to the statements came as can be seen in Table 23 below:

**Table 23 Statements concerning Facilitating conditions (FC)**

Facilitating conditions	1	2	3	4	5	6	7
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<b>FC1: I have the resources (laptops, smartphones, etc.) necessary to attend MOOCs and get support on all levels</b>	0.4	0.4	1.2	3.6	3.2	25.7	65.6
<b>FC2: I have the necessary knowledge to attend MOOCs and get support on all levels</b>	0.8	0	0.4	2.4	10.3	32.4	53.8
<b>FC3: Attending MOOCs is not compatible with my platform</b>	50.6	19.8	7.1	9.5	2.8	2.4	7.9
<b>FC4: If I have some difficulties with a MOOC, support is available for assistance</b>	6.3	3.6	2.8	20.9	17.4	28.1	20.9
<b>FC5: Support for MOOCs is easy to get</b>	0.4	1.2	4.0	21.7	24.9	26.5	21.3
<b>FC6: MOOCs availability on a 24/7 basis is truly appreciated</b>	0.4	1.2	2.0	7.5	11.1	29.2	48.6
<b>FC7: Time Flexibility in attending MOOCs makes it very helpful</b>	0.4	0	2.0	4.7	4.7	23.7	64.4
<b>FC8: The minimum time constraint in attending MOOCs is very helpful</b>	0.4	1.6	1.6	11.1	13.0	34.4	37.9
<b>FC9: Continuous accessibility to MOOCs is very helpful</b>	0.4	1.2	0.8	4.7	6.3	26.5	60.1
<b>FC10: It is very helpful to access MOOCs anytime</b>	0.4	1.2	0.8	5.1	4.0	22.5	66

Fear of Technological advances, answers to the statements came as can be seen in Table 25 below:

**Table 24 Statements concerning Fear of Technological Advances**

Fear of Technological advances	1	2	3	4	5	6	7
<b>FOTA1: I am worried about the rapid advances in MOOCs</b>	33.6	22.9	9.9	14.6	9.1	5.9	4.0
<b>FOTA2: I am not comfortable with the trends in technological advancement of MOOCs</b>	40.3	30.4	5.9	10.3	4.3	5.5	3.2
<b>FOTA3: I am feeling anxious about attending MOOCs since the outbreak of COVID-19</b>	54.4	19.8	6.3	7.9	4.0	4.0	3.6

Answers to statements concerning Perceived Privacy, Security and Trust can be seen in Table 25 below:

**Table 25 Statements concerning perceived privacy, security and trust**

Perceived privacy, security and Trust	1	2	3	4	5	6	7
<b>PPST1: I trust MOOCs</b>	0.4	0.4	1.2	7.5	17.4	38.3	34.8
<b>PPST2: I believe that attending MOOCs is trustworthy</b>	0.4	0.4	1.2	7.9	15.4	37.5	37.2

<b>PPST3: I do not doubt the honesty of MOOCs participants</b>	1.6	0.8	4.0	18.2	22.1	28.5	24.9
<b>PPST4: Attending MOOCs has the ability to fulfill my informational needs</b>	0.8	0.4	2.0	8.7	17.4	35.2	35.6
<b>PPST5: The chances of losing control over my personal information is high when attending MOOCs</b>	15.8	25.7	14.6	24.1	9.9	6.3	3.6
<b>PPST6: I think attending MOOCs could lead to the exposure of my personal information</b>	17.0	23.3	15.4	20.9	11.9	7.5	4.0
<b>PPST7: Attending MOOCs would reduce the privacy of my personal information</b>	19.0	24.5	15.0	19.8	12.6	5.9	3.2

Table 26 below shows the results concerning the statements about Behavioral intention.

**Table 26 statements concerning Behavioral Intention (BI)**

Behavioral intention	1	2	3	4	5	6	7
<b>BI1: Assuming I have access to MOOCs, I intend to use it</b>	0.8	0.4	0	6.7	10.7	37.5	43.9
<b>BI2: Given that I had access to MOOCs I predict that I would use it</b>	0.8	0.8	0.4	6.7	15.4	32.0	43.9
<b>BI3: I plan to attend MOOCs in the future</b>	0.8	0.4	0	6.7	10.7	37.5	43.9

As for table 27, it shows results about statements concerning User behavior.

**Table 27 statements concerning User Behavior**

User behavior	1	2	3	4	5	6	7
<b>UB1: I have attended at least one MOOC within the last 6 months</b>	7.5	11.5	2.4	4.7	8.3	20.6	45.1
<b>UB2: I haven't attended any MOOCs</b>	70.0	14.2	1.6	3.6	2.0	2.4	6.3
<b>UB3: I attend MOOCs frequently</b>	10.7	12.6	12.6	22.9	17.8	13.8	9.5

As for Social perceptiveness, answers to the statements came as can be seen in Table 28.

**Table 28 statements concerning Social Perceptiveness**

Social perceptiveness	1	2	3	4	5	6	7
<b>SPI: My perceptiveness of how the rest of the learners were advancing helped me in the way I was advancing in the MOOCs]</b>	8.3	11.5	6.7	30.8	17.8	14.6	10.3

SP2: My sensitivity and understanding of others perspectives helped me to advance in MOOCs]	7.1	9.5	9.1	26.1	22.1	15.8	10.3
SP3: My ability to listen well and be attentive to emotional cues in real life played a role in my advance in MOOCs	7.1	5.9	4.7	26.5	20.2	19.0	16.6
SP4: Because I seek mutual understanding and welcome sharing of information, MOOCs experience was successful for me	4.7	7.1	1.6	23.3	18.6	27.7	17.0
SP5: Because I show concern for others' needs, advancing in MOOCs was not difficult	7.1	9.9	4.3	35.2	16.2	17.0	10.3
SP6: My ability to recognize my own strengths and weaknesses made advancing in MOOCs easier	3.6	3.2	1.6	22.1	19.8	27.3	22.5

Table 29 shows the respondents' answers concerning Group work effectiveness.

**Table 29 Statements concerning Group work Effectiveness**

Group work effectiveness	1	2	3	4	5	6	7
GWE1: Being aware of what people in the MOOCs were doing helps me in relation to making proper choices regarding my E-learning experience	5.5	7.1	5.5	27.3	25.3	17.4	11.9
GWE2: Getting support from people in the MOOCs makes me resolve issues easier	4.0	4.3	5.1	25.7	24.1	23.3	13.4
GWE3: People in the MOOCs are able to work through differences of opinion without damaging the outcomes	2.8	2.0	2.8	30.0	23.3	25.3	13.8
GWE4: I would get a better outcome if I work alone in MOOCs	9.5	11.5	10.3	36.4	12.6	11.1	8.7
GWE5: My work in the MOOCs makes dealing with problems easier	2.0	2.4	4.0	34.8	25.3	17.8	13.8

The results of the mean and standard deviation for Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, FOTA fear of Technological advances, Trust, Perceived privacy& Security, Behavioral intention and User behavior can be seen in Table 30 below:

**Table 30 Mean and Standard Deviation for the Textual Description**

Scale	Code	Textual Description	Mean	SD
Performance Expectancy	PE1	PE1: I would find MOOCs useful for my career or job.	5.94	1.18
	PE2	PE2: Attending MOOCs facilitates the accomplishment of tasks more quickly	5.36	1.22

	<b>PE3</b>	PE3: Attending MOOCs enhances productivity.	5.46	1.30
	<b>PE4</b>	PE4: I would attend MOOCs again.	6.32	0.93
	<b>PE5</b>	PE5: I would find using MOOCs advantageous amid the COVID-19 pandemic	6.24	1.17
<b>Effort Expectancy</b>	<b>EE1</b>	EE1: I find it easy to attend MOOCs	5.77	1.20
	<b>EE2</b>	EE2: The interaction with MOOCs is easy for me	5.81	1.24
	<b>EE3</b>	EE3: The process of learning through MOOCs is easy for me	5.85	1.17
	<b>EE4</b>	EE4: I would find MOOCs easy for me to use	5.98	1.05
	<b>EE5</b>	EE5: It is easy to use MOOCs and stay safe from COVID-19	6.25	1.17
<b>Social Influence</b>	<b>SI1</b>	SI1: The majority of my family use MOOCs	2.46	1.54
	<b>SI2</b>	SI2: Colleagues who are important to me believe that I should attend MOOCs	3.69	1.64
	<b>SI3</b>	SI3: The majority of my friends attend MOOCs	2.88	1.65
	<b>SI4</b>	SI4: People who have an impact on my behavior think that I should attend MOOCs	3.71	1.72
	<b>SI5</b>	SI5: One of my family members/friends/colleagues has recommended that I should attend MOOCs	3.36	1.92
<b>Facilitating conditions</b>	<b>FC1</b>	FC1: I have the resources (laptops, smartphones, etc.) necessary to attend MOOCs and get support on all levels	6.48	0.93
	<b>FC2</b>	FC2: I have the necessary knowledge to attend MOOCs and get support on all levels	6.34	0.93
	<b>FC3</b>	FC3: Attending MOOCs is not compatible with my platform	2.33	1.86
	<b>FC4</b>	FC4: If I have some difficulties with a MOOC, support is available for assistance	5.08	1.66
	<b>FC5</b>	FC5: Support for MOOCs is easy to get	5.35	1.24
	<b>FC6</b>	FC6: MOOCs availability on a 24/7 basis is truly appreciated	6.10	1.17
	<b>FC7</b>	FC7: Time Flexibility in attending MOOCs makes it very helpful	6.42	0.99
	<b>FC8</b>	FC8: The minimum time constraint in attending MOOCs is very helpful	5.90	1.20
	<b>FC9</b>	FC9: Continuous accessibility to MOOCs is very helpful	6.35	1.05
	<b>FC10</b>	FC10: It is very helpful to access MOOCs anytime	6.43	1.04
<b>FOTA</b>	<b>FOTA1</b>	FOTA1: I am worried about the rapid advances in MOOCs	2.75	1.79
	<b>FOTA2</b>	FOTA2: I am not comfortable with the trends in technological advancement of MOOCs	2.37	1.68
	<b>FOTA3</b>	FOTA3: I am feeling anxious about attending MOOCs since the outbreak of COVID-19	2.13	1.67
	<b>PPST1</b>	PPST1: I trust MOOCs	5.96	1.04

<b>Trust, Perceived privacy, Security</b>	PPST2	PPST2: I believe that attending MOOCs is trustworthy	6.00	1.06
	PPST3	PPST3: I do not doubt the honesty of MOOCs participants	5.45	1.33
	PPST4	PPST4: Attending MOOCs has the ability to fulfill my informational needs	5.90	1.14
	PPST5	PPST5: The chances of losing control over my personal information is high when attending MOOCs	3.21	1.62
	PPST6	PPST6: I think attending MOOCs could lead to the exposure of my personal information	3.26	1.69
	PPST7	PPST7: Attending MOOCs would reduce the privacy of my personal information	3.13	1.66
	<b>Behavioral Intention</b>	BI1	BI1: Assuming I have access to MOOCs, I intend to use it	6.15
BI2		BI2: Given that I had access to MOOCs I predict that I would use it	6.07	1.11
BI3		BI3: I plan to attend MOOCs in the future	6.19	1.10
<b>Use Behavior</b>	UB1	UB1: I have attended at least one MOOC within the last 6 months	5.37	2.07
	UB2	UB2: I haven't attended any MOOCs	1.85	1.73
	UB3	UB3: I attend MOOCs frequently	4.04	1.79

Statisticians have determined that values no greater than plus or minus 2 SD represent measurements that are more closely near the true value than those that fall in the area greater than  $\pm 2SD$ . The results of the standard deviation of these scales came within this range.

A test was made to check the mean, median, standard deviation and the minimum/maximum for these scales and below is the table of results (Table 31).

**Table 31 Mean Median and Standard Deviation for the parameters**

	Performance Expectancy	Effort Expectancy	Social Influence	Facilitating conditions	FOTA	Trust, Perceived privacy & Security	Behavioral Intention	Use Behavior
N	253	253	253	253	253	253	253	253
Mean	5.90	5.92	3.20	5.12	2.43	4.68	6.13	3.75
Median	6.00	6.00	3.00	5.00	2.00	5.00	6.00	4.00
Std. Deviation	0.963	1.038	1.415	0.878	1.515	0.833	1.001	1.202
Minimum	1	1	1	1	1	1	1	1
Maximum	7	7	7	7	7	7	7	7

### 4.3 Reliability Analysis

To test the reliability and internal consistency of the variables of the model as a whole and those of the proposed model, the researcher resorted to using Cronbach's alpha. According to scholars the minimum acceptable value for Cronbach alpha is 0.7; a value below 0.70 would make the reliability of the data questionable (George & Mallery, 2003; Tavkol & Dennic, 2011). The researcher calculated the Cronbach's alpha by taking into consideration that it is a must to use summated statements for each factor, and not individual questions while calculating Cronbach's alpha because "Cronbach's alpha does not provide reliability estimates for single items" (Gliem, & Gliem, 2003, p.88).

**Table 32 Reliability Analysis**

Scale	Cronbach's Alpha $\alpha$	No. of items	Items
Performance Expectancy	.861	5	PE1 -> PE5
Effort Expectancy	.919	5	EE1 -> EE5
Social Influence	.869	5	SI1 -> SI5
Facilitating conditions	.803	10	FC1 -> FC10
FOTA	.834	3	FOTA1 -> FOTA3
Trust, Perceived privacy & Security	.642	7	PPST1 -> PPST7
Behavioral Intention	.906	3	BI1 -> BI3
User Behavior	.230	3	UB1 -> UB3
Social Perceptiveness	.893	6	SP1 -> SP6
Group Work Effectiveness	.714	5	GWE1 -> GWE5
RME Photos	.717	36	Photos 1 -> Photos 36

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So after calculating the Cronbach’s alpha for the data collected of 253 responses, the analysis showed that the results of reliability analysis summarized in Table 32 (results are in Appendix V) show that the factors, the data collected as well as the overall proposed model are reliable and thus the proposed model is appropriate for this research.

#### 4.4 Pearson Correlation Analysis

To check whether there is any linear relationship between the independent and dependent variables, the researcher resorted to conducting a Pearson Correlation analysis through SPSS. Pearson correlation is conducted to measure the relationship between the different variables (Fisher, 2010). It is a “statistical test that assesses the strength of the relationship between two numerical data variables” (Saunders et al., 2009, P.597). Thus, it is necessary to use this test in this research to test how strong the relationships between the different variables are, and their direction.

As previously mentioned, the Pearson Correlation Coefficient measures the linear correlation between two variables, with a score of 1 denoting total positive correlation, 0 denoting no correlation, and -1 denoting total negative correlation.

Table 33 below (along with Appendix VI) displays this research’s results obtained from the Pearson Correlation Analysis. The results show that all of the independent variables have a relationship with the dependent variable. This shows that there are linear relationship between the independent and dependent variables which is a requirement to be able to proceed with multiple linear regression analysis.

**Table 33 Pearson Correlation Coefficients Analysis Results**

	Performance Expectancy	Effort Expectancy	Social Influence	Facilitating conditions	FOTA	Trust, Perceived privacy & Security	Behavioral Intention	Use Behavior
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Performance Expectancy	Pearson Correlation	1	.526**	.201**	.376**	-.066	.338*	.448**	.161*
	P.value		.000	.001	.000	.299	.000	.000	.011
	N	253	253	253	253	253	253	253	253
Effort Expectancy	Pearson Correlation	.526**	1	.143*	.463**	-.134	.191*	.606**	.171**
	P.value	.000		.023	.000	.033	.002	.000	.006
	N	253	253	253	253	253	253	253	253
Social Influence	Pearson Correlation	.201**	.143*	1	.339**	.261**	.150*	.152*	.419**
	P.value	.001	.023		.000	.000	.017	.016	.000
	N	253	253	253	253	253	253	253	253
Facilitating conditions	Pearson Correlation	.376**	.463**	.339**	1	.104	.271*	.395**	.267**
	P.value	.000	.000	.000		.099	.000	.000	.000
	N	253	253	253	253	253	253	253	253
FOTA	Pearson Correlation	-.066	-.134*	.261**	.104	1	.193*	-.087	.217**
	P.value	.299	.033	.000	.099		.002	.168	.001
	N	253	253	253	253	253	253	253	253
Trust, Perceived privacy & Security	Pearson Correlation	.338**	.191**	.150*	.271**	.193**	1	.264**	.126*
	P.value	.000	.002	.017	.000	.002		.000	.045
	N	253	253	253	253	253	253	253	253

Behavioral Intention	Pearson Correlation	.448**	.606**	.152*	.395**	-.087	.264*	1	.331**
	P.value	.000	.000	.016	.000	.168	.000		.000
	N	253	253	253	253	253	253	253	253
Use Behavior	Pearson Correlation	.161*	.171**	.419**	.267**	.217**	.126*	.331**	1
	P.value	.011	.006	.000	.000	.001	.045	.000	
	N	253	253	253	253	253	253	253	253

Pearson correlation coefficient is positive in almost all variables relations except for some of FOTA relations, and this indicates that there is a positive relationship between almost all independent factors and the dependent factor.

More specifically and based on this research model, the researcher can deduce the following when it comes to the linear relation between the independent variables and the dependent variable. Having a result  $>0.4$  is relatively strong, between  $0.3$  and  $0.49$  is moderate whereas  $<0.29$  is weak (Statistics, 2018); in fact the degree of correlation is as follows

- If the coefficient value is near  $\pm 1$ , then it said to be a perfect correlation and can be interpreted as follows: as one variable increases, the other variable tends to also increase (if the number is positive) or decrease (if the number is negative).
- If the coefficient value lies between  $\pm 0.50$  and  $\pm 1$ , then it is said to be a strong high degree correlation.
- If the coefficient value is between  $\pm 0.30$  and  $\pm 0.49$ , then it is said to be a medium correlation, a moderate degree correlation.
- When the coefficient value is below  $+ .29$ , then it is said to be a small correlation. Low degree correlation.
- When the coefficient value is zero, then there is no correlation

Based on the above, we can deduce that

PE  $\rightarrow$  BI with a result of  $0.448$  has moderate positive correlation.

EE -> BI with a result of 0.606 has moderately strong positive correlation and a perfect degree of correlation

SI -> BI with a result of 0.152 is weak positive correlation

FC -> BI with a result of 0.395 is moderate positive correlation

BI -> UB with a result of 0.331 is moderate positive correlation

FC -> UB with a result of 0.267 is weak positive correlation

The standard alpha value is .05; in all of the above the value was less than alpha, which means that our correlations among scales are highly significant.

Moreover, the researcher checked the multi collinearity which refers to the moderately or highly correlated independent variables in a multiple regression model (Farrar & Glauber, 1967). A multi collinearity problem arises if coefficients between the independent variables are too high (Hew et al., 2015). The demonstrations showed that all VIF are below 10 and tolerance values are greater than .10 as shown in the table below (see Table 34)

**Table 34 Collinearity Statistics**

Model		Coefficients <sup>a</sup>						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.262	.374		3.378	.001		
	PE	.106	.060	.102	1.764	.079	.667	1.500
	EE	.323	.064	.335	5.057	.000	.510	1.960
	SI	.029	.036	.041	.799	.425	.865	1.156
	FCOriginal	.023	.069	.020	.327	.744	.614	1.628
	FC_Final	.347	.076	.311	4.564	.000	.480	2.083

a. Dependent Variable: BI

Add to this, in the case of this research the Pearson Correlation Coefficient is less than 0.7 in all independent variables which indicates that the data does not suffer from multicollinearity (Pallant, 2007).

## 4.5 Simple Linear Regression

### Performance expectancy/BI

The researcher performed a simple linear regression to test the predictability of the dependent variable or in this case the behavioral intention of using MOOCs based on the independent variable of Performance Expectancy. Results can be seen in Table 35; they are as follows:

**Table 35 Simple linear regression: Performance expectancy/BI-Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.448 <sup>a</sup>	.200	.197	.897

a. Predictors: (Constant), PE

Looking at the model summary, R square is .200, the researcher can conclude that 20% of the variance in Behavioral intention was predicted from Performance Expectancy. As for the ANOVA table below, it shows that this interpretation is significant, and that the model using PE as a predictor is significantly better than prediction without using PE.

**Table 36 Simple linear regression: Performance expectancy/BI-ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.613	1	50.613	62.865	.000 <sup>b</sup>
	Residual	202.083	251	.805		

Total	252.696	252			
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a. Dependent Variable: BI

b. Predictors: (Constant), PE

The ANOVA table above shows us that the model works, and now through the coefficients table below, the researcher will interpret how it works.

**Table 37 simple linear regression: Performance expectancy/BI-Coefficients**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.384	.351		9.640	.000
	PE	.465	.059	.448	7.929	.000

a. Dependent Variable: BI

For every increase of one unit in PE, BI will increase of .465 and the regression equation for predicting BI from PE is  $Y=3.384+0.465X$

**Effort Expectancy/BI**

The researcher performed a simple linear regression to test the predictability of behavioral intention of using MOOCs based on the independent variable of Effort Expectancy. Results were as follows:

**Table 38 Simple linear regression: Effort expectancy/BI-Model Summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.606 <sup>a</sup>	.368	.365	.798

a. Predictors: (Constant), EE

Looking at the model summary, R square is .368, the researcher can conclude that 36.8% of the variance in Behavioral intention was predicted from Effort Expectancy. As for the ANOVA table below, it shows that this interpretation is significant, and that the model using EE as a predictor is significantly better than prediction without using EE.

**Table 39 Simple linear regression: Effort expectancy/BI-ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	92.894	1	92.894	145.908	.000 <sup>b</sup>
	Residual	159.802	251	.637		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), EE

The ANOVA table above shows us that the model works and now through the coefficients table below, the researcher will interpret how it works.

**Table 40 Simple linear regression: Effort Expectancy/BI-Coefficients**

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.
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	B	Std. Error	Beta		
1 (Constant)	2.668	.291		9.167	.000
EE	.585	.048	.606	12.079	.000

a. Dependent Variable: BI

For every increase of one unit in EE, BI will increase of .585 and the regression equation for predicting BI from EE is  $Y=2.668 +0.585X$

### Social Influence/BI

The researcher performed a simple linear regression to test the predictability of behavioral intention of using MOOCs based on the independent variable of Effort Expectancy. Results were as follows:

**Table 41 Simple linear regression: Social Influence/BI-Model Summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.152 <sup>a</sup>	.023	.019	.992

a. Predictors: (Constant), SI

Looking at the model summary, R square is .023, the researcher can conclude that 2.3% of the variance in Behavioral intention was predicted from Social Influence. As for the ANOVA table below, it shows that this interpretation is significant, and that the model using SI as a predictor is significantly better than prediction without using SI.

**Table 42 Simple linear regression: Social Influence/BI- ANOVA**

**ANOVA<sup>a</sup>**

Model	Sum of Squares	Df	Mean Square	F	Sig.
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1	Regression	5.809	1	5.809	5.905	.016 <sup>b</sup>
	Residual	246.887	251	.984		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), SI

The ANOVA table above shows us that the model works and now through the coefficients table below, the researcher will interpret how it works.

**Table 43 Simple linear regression: Social Influence/BI- Coefficients**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.787	.154		37.510	.000
	SI	.107	.044	.152	2.430	.016

a. Dependent Variable: BI

For every increase of one unit in SI, BI will increase of .107 and the regression equation for predicting BI from SI is  $Y=5.787 +0.107X$

**Facilitating condition/BI**

The research extended this independent variable to include, in addition to the statements that test the original facilitating conditions that were tested in the original UTAUT, the researcher added a set of statements testing the effect of the Continuous Availability and Time Flexibility of MOOCS. Performing a simple linear regression to test the predictability of behavioral intention of using MOOCs based on the independent variable Facilitating conditions, results were as follows:

First for the original FC:

**Table 44 Simple linear regression: Facilitating Conditions/BI-Model Summary****Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.395 <sup>a</sup>	.156	.153	.922

a. Predictors: (Constant), FC Original

Looking at the model summary, R square is .156, the researcher can conclude that 15.6% of the variance in Behavioral intention was predicted from the original Facilitating conditions. As for the ANOVA table below, it shows that this interpretation is significant, and that the model using FC original as a predictor is significantly better than prediction without using FC original.

**Table 45 Simple linear regression: Facilitating Conditions/BI- ANOVA****ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	39.402	1	39.402	46.368	.000 <sup>b</sup>
	Residual	213.293	251	.850		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), FCOriginal

**Table 46 Simple linear regression: Facilitating conditions/BI-Coefficients****Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.
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		B	Std. Error	Beta		
1	(Constant)	3.822	.344		11.113	.000
	FCOriginal	.450	.066	.395	6.809	.000

a. Dependent Variable: BI

However when testing the extended Facilitating condition here called FC final, results were as follows:

**Table 47 Simple linear regression: Facilitating Conditions Final/BI-Model Summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.595 <sup>a</sup>	.354	.352	.806

a. Predictors: (Constant), FC\_Final

Looking at the model summary, R square is .354, the researcher can conclude that 35.4% of the variance in Behavioral intention was predicted from the final Facilitating conditions. As for the ANOVA tables below, they show that these interpretations are significant.

**Table 48 Simple linear regression: Facilitating Conditions Final/BI- ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	89.549	1	89.549	137.770	.000 <sup>b</sup>
	Residual	163.147	251	.650		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), FC\_Final

So the decision was to adopt the Final Facilitating conditions as they seem to have a higher impact on the independent variable. And in this case, below is the coefficient table:

**Table 49 Simple linear regression: Facilitating Conditions Final/BI-Coefficients**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.072	.349		5.927	.000
	FC_Final	.664	.057	.595	11.738	.000

a. Dependent Variable: BI

For every increase of one unit in Facilitating Conditions, BI will increase of .664 and the regression equation for predicting BI from EE is  $Y=2.072 +0.664X$

**BI/UB**

Behavioral Intention to attend MOOCs was found, as expected, to have a significant positive effect on usage behavior.

**Table 50 Simple linear regression: BI/UB-Model Summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.331 <sup>a</sup>	.110	.106	1.136

a. Predictors: (Constant), BI

Looking at the model summary, R square is .110, the researcher can conclude that 11% of the variance in Behavioral Usage was predicted from the BI. As for the ANOVA table below, it shows that this interpretation is significant.

**Table 51 Simple linear regression: BI/UB- ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	39.849	1	39.849	30.874	.000 <sup>b</sup>
	Residual	323.961	251	1.291		
	Total	363.810	252			

a. Dependent Variable: UB

b. Predictors: (Constant), BI

**Table 52 Simple linear regression: BI/UB-Coefficients**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.313	.444		2.957	.003
	BI	.397	.071	.331	5.556	.000

a. Dependent Variable: UB

For every increase of one unit in BI, UB will increase of .397 and the regression equation for predicting UB from BI is  $Y=1.313 + 0.397X$

Similarly, a linear regression test was done to determine the effect of the Facilitating condition of the actual User behavior and the results showed that the small effect was not statistically significant.

**Table 53 simple linear regression: FC/UB- Model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.071 <sup>a</sup>	.005	.001	1.201

a. Predictors: (Constant), FC\_Final

**Table 54 simple linear regression: FC/UB-ANOVA**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.821	1	1.821	1.263	.262 <sup>b</sup>
	Residual	361.989	251	1.442		
	Total	363.810	252			

a. Dependent Variable: UB

b. Predictors: (Constant), FC\_Final

## 4.6 Multiple Linear Regression

The assumptions of multiple regression (linearity, homoscedasticity, and absence of multi collinearity) were assessed. The absence of multi collinearity was shown in the previous paragraph; as for linearity, it assumes that there is a straight line relationship between the predictor variables or the independent variables and the dependent variable or criterion variable, and as for homoscedasticity, it assumes there is no relationship between the residuals and the independent variables. It is met when the residuals' plot has the points randomly distributed and the distribution line is approximately straight. Linearity and homoscedasticity were assessed by examination of a scatter plot and the results were satisfactory hence the researcher moved on with the analysis.

The researcher performed a Multiple Linear Regression to test the holistic effect of all the independent variables at the same time on the dependent variables; results are interpreted below:

Through SPSS, the researcher tested R-squared (the multiple correlation coefficient of determination) so that it can be used for the purpose of determining how much variance in the dependent variable, the Behavioral Intention in the case of this research, could be accounted for by the set of independent variables. Adjusted R square is 0.437 which can be interpreted as follows: 43.7 % of the variance of our dependent variable which is the Behavioral Intention is explained by the independent variables.

**Table 55 Multiple Linear Regression- Model summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.669 <sup>a</sup>	.448	.437	.752	.448	40.087	5

Moving to the ANOVA findings:

**Table 56 Multiple Linear Regression- ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	113.199	5	22.640	40.087	.000 <sup>b</sup>
	Residual	139.497	247	.565		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), FC\_Final, SI, PE, FC Original, EE

We have statistically significant findings here, so the model is statistically significant. As for the coefficients, the results were as follow:

**Table 57 Multiple Linear Regression- Coefficients****Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.262	.374		3.378	.001
	PE	.106	.060	.102	1.764	.079
	EE	.323	.064	.335	5.057	.000
	SI	.029	.036	.041	.799	.425
	FCOriginal	.023	.069	.020	.327	.744
	FC_Final	.347	.076	.311	4.564	.000

The researcher used the t test to check the significance of each of the predictors whereas beta coefficients were used to check the extent of prediction of each of the independent variables. If a predictor is significant, then this would mean that every one-unit increase in the predictor, the dependent variable will increase or decrease by the number of unstandardized beta coefficients.

The significant predictors in the case of this research were the EE and the FC final having a p value less than .005 so these two have a statistically significant contribution on the outcome variable. Looking at the unstandardized coefficients of these two, for EE it is .323 and for FC final it is .347 we can deduce that as the EE index increases for one, we will see a change of 0.323 increase in BI, same for Facilitating conditions, if FC index increases for one, there will be a change of 0.3347 increase in BI. In conclusion, Effort Expectancy and the extended Facilitating conditions that focuses on time flexibility and continuous availability have the strongest impact of the behavioral intention of professionals to attend MOOCs. The equation that predicts the effect of these independent variables on the independent variable would be:  $Y = 1.262 + 0.323X_1 + 0.347X_2$

## 4.7 Moderating Variables

A moderator represents a third variable that has an effect on the magnitude and strength of the relationship between the independent variable and the dependent variable. If a correlation relationship exists between these variables, (PE, EE, SI, FC and BI) we can proceed and test the impact of the moderation variable.

Throughout the years, and as literature shows, there have been several attempts to test the moderating effects of certain variables on the relationships among BI and each of the PE, EE, SI and FC. While Venkatesh, et al. (2003) started with the moderating effects of age, gender and experience, other scholars attempted to extend the study to include other types of variables. Several tested the effect of culture as a moderator affecting the relationship among the behavioral intention to use a technology and the PE, EE, SI and FC (Al-Gahtani, et al., 2007), (Venkatesh & Zhang, 2010), (Yuen, et al., 2010). Others studied the effects of ethnicity, religion, language... This particular research will attempt to study the effects of social perceptiveness related to emotional intelligence and Group Work Effectiveness related to Collective Intelligence on the relationships of BI with some of the independent variables.

In the case of this research, M is the moderator, Xs are the predictor variables (or independent variables) and Y is the outcome (the dependent variable), and the aim would be to test whether or not the moderator affects this relationship, and if so, does it affect it positively or negatively? In order to do this, the researcher conducted a regression coefficient analysis and an ANOVA test to look into the interaction effect between the independent variable and the dependent variable (Frazier, Barron and Tix, 2004).

Before testing the moderating effect of certain variables, the researcher extended the analysis by running some tests on these variables whose moderation effect will be tested, especially the Social Perceptiveness variables since the researcher used two methods to test it in respondents: first an experiment, and second a set of statements; below are some notes before proceeding with the tests:

- The Social Perceptiveness effect as a moderator on EE and SI

By doing the experiment of Reading the Mind in the Eyes, the researcher used the 36 photos to predict how much social perceptiveness the respondents have, and the results were based on a

standardized well known test. However, another section in the questionnaire was also dedicated for testing the social perceptiveness as each respondent sees himself/herself having, and here the results were based on the respondents' self evaluation.

The researcher ran a t-test to see if the difference in the scores of the photos is affected by gender. The results were as follows:

**Table 58 Group Statistics**

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Grades	1	66	27.0909	3.61504	.44498
	2	187	23.4332	5.18990	.37952

Gender 1 is for females, gender 2 for males

**Table 59 Independent Samples Test**

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Grades	Equal variances assumed	7.638	.006	5.288	251	.000	3.65775	.69176	2.29536	5.02015
	Equal variances not assumed			6.254	163.692	.000	3.65775	.58485	2.50294	4.81257

Looking at the mean results in the first table, it appears that females had better scores and higher grades on the experiment. To test this, we look at the independent sample test table (Table 59).

The null hypothesis is that these two groups are the same. Looking at Levene's Test for Equality of Variances p is  $0.006 < 0.05$ , so we reject the null hypothesis. This means that equal variances

is not assumed; and shows that the difference in mean between females and males is statistically significantly too.

In addition to this, the researcher divided the results of the grades into 7 categories. Each respondent got one grade for each correct photo he/she chose. Thus the score was over 36. The coding of the categories of the scores were as follows:

- 1- Less than 12
- 2- between 13 and 16
- 3- between 17 to 20
- 4- between 21 to 24
- 5- between 25 to 28
- 6- between 29 to 32
- 7- between 33 to 36

These categories will be used at a later stage in the analysis.

Now for the moderation effects, the researcher tested these two variables: the Social Perceptiveness and the Group Work Effectiveness. This moderation effect is tested to see its effect on the relationship of some of the independent variables with the dependent variable.

#### **4.8 Hypotheses Testing**

In section 4.7, several main relationships in this research will be investigated. The researcher will study the relationship between the independent variables and the Behavioral intention to attend MOOCs. More specifically, the researcher will investigate the following relationships: first, the relationship between Performance Expectancy and the Behavioral Intention to attend MOOCs and see the effect of Performance Expectancy and to which extent this independent variable can affect the user's intention to accept and attend MOOCs. Second, the relationship between Effort Expectancy and the Behavioral Intention to attend MOOCs and see the effect of Effort Expectancy and to which extent this independent variable can affect the user's intention to accept and attend MOOCs. The third relationship, the relationship between Social Influence and the Behavioral Intention to attend MOOCs and see the effect of Social Influence and to which extent this independent variable can affect the user's intention to accept and attend MOOCs. The fourth relationship, the relationship between Facilitating conditions and the Behavioral Intention to attend

MOOCs and see the effect of Facilitating conditions and to which extent this independent variable can affect the user's intention to accept and attend MOOCs. These four relationships are studied not only through simple linear regression but also through multiple linear regression. In addition to this, this section will look into several hypotheses (Hypotheses H2 to H6) where the effect of two moderator variables, namely Social Perceptiveness and Group Work Effectiveness will be investigated to see if these two moderators will have an effect on the four relationships between the independent variables and the dependent variable mentioned earlier.

#### **4.8.1 Testing Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions towards the behavioral intentions of learners to attend MOOCs**

##### **Hypothesis 1**

**H1: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions will positively affect behavioral intentions to attend MOOCs.**

The first hypothesis assumes that there are relationships between the independent variables and the dependent variable; i.e. Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions will positively affect behavioral intentions to attend MOOCs. To test whether this hypothesis is rejected or not, and to investigate whether or not the hypothesis is supported, the researcher has two possible scenarios: the first scenario is to test the model as a whole and thus see the effects of these independent variables on the behavioral intention to attend MOOCs and in that way, the weak variables whose effects are not very significant will be removed. In this scenario, the researcher resorts to using multiple linear regression test. The second scenario is to separately test the relationships of each independent variable, i.e. the effect of Performance Expectancy on users' behavioral intentions to attend MOOCs, the effect of Effort Expectancy on users' behavioral intentions to attend MOOCs, the effect of Social Influence on users' behavioral intentions to attend MOOCs and finally the effect of Facilitating Conditions on users' behavioral intentions to attend MOOCs. In this scenario, the researcher resorts to using the simple linear regression test. The researcher decided to use both scenarios for the following reasons: first because one of the aims of the research is to study the model as a whole and specifically check these four independent variables that are frequently used by researchers whenever investigating the technology acceptance especially while using UTAUT. This aim would be perfectly investigated while resorting to steps of the first scenario. However, the research has another aim

which is to try to investigate variables that might have moderating effects on these traditional relationships often studied. Thus, the researcher resorts to the second scenario too. In this way, the researcher will make sure to thoroughly and deeply study all the options, thereby even the weakest relationships that are often disregarded will be taken into consideration. In this scenario, the researcher resorts to using the simple linear regression.

Several steps were followed in order to test the relationship between the independent variables and dependent variable. The first step consisted of summing all the statements that formed each of the independent variables and the dependent variable. The researcher had to take a decision of either using the median statistical function, a function that will place the results in the same scale of the Likert scale, or using the summation of all variables. As mentioned earlier, the researcher resorted to the summation of all variables.

For instance, the five statements testing Performance Expectancy were summed into one variable entitled PE, and the same was applied to the rest of the variables: the five statements testing Effort Expectancy were summed into one variable entitled EE; the five statements testing Social Influence were summed into one variable entitled SI, the ten statements testing Facilitating Conditions were summed into one variable entitled FC; the three statements testing user's Behavioral Intention were summed into one variable entitled BI; the five statements testing Group Work Effectiveness were summed into one variable entitled GWE; the result or the grades of the 36 photos, where each correct choice was given one grade and the sum was called Grade.

To examine this research question, and as per the first scenario, a multiple linear regression was conducted to assess if the independent variables predict the dependent variable (criterion). The independent variables include Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions while the dependent variable is the Behavioral Intention to attend MOOCs. The regression equation (main effects model) and standard multiple linear regression (the enter method) was used for this research question.

Multi collinearity was not present, with all VIF well below the threshold of 10. The results of the linear regression were significant,  $p = .000$ , and because the researcher is using multiple linear regression in this scenario, the  $R^2$  is to be checked and the result of R square is = 0.448, suggesting that EE, PE, SI and FC accounted for 44.8% of the variance in BI. Table 60 summarizes these results and shows that 44.8% of the variance of a user's intention to attend MOOCs can be

explained by these four independent variable. Table 61, the ANOVA table, clearly shows that this interpretation and the R square results are significant since p is .000.

**Table 60 R Square result**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.669 <sup>a</sup>	.448	.439	.750

a. Predictors: (Constant), FC\_Final, SI, PE, EE

**Table 61 ANOVA showing the significance of the R Square results**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	113.138	4	28.285	50.263	.000 <sup>b</sup>
	Residual	139.557	248	.563		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), FC\_Final, SI, PE, EE

The individual predictors were then examined further, and the following results can be seen in the table 62 below that summarizes these results.

PE is not a significant predictor of BI,  $B = 0.103$ ,  $p = 0.075$ .  $P$  being  $> 0.05$ , this result is considered insignificant and thus PE is not a significant predictor of a user's Behavioral Intention to accept and attend MOOCs.

EE is a significant predictor of BI,  $B = 0.337$ ,  $p = 0.000$ .  $P$  being  $< 0.05$ , the result is significant and EE is a significant predictor of a user's Behavioral Intention to accept and attend MOOCs suggesting that for every one-unit increase in PE, BI increased by 0.337 units.

SI is not a significant predictor of BI,  $B = 0.046$ ,  $p = 0.344$ .  $P$  being  $> 0.05$ , this result is considered insignificant and thus SI is not a significant predictor of a user's Behavioral Intention to accept and attend MOOCs.

FC is a significant predictor of BI,  $B = 0.319$ ,  $p=0.000$ .  $P$  being  $<0.05$ , the result is significant and FC is a significant predictor of a user's Behavioral Intention to accept and attend MOOCs suggesting that for every one-unit increase in FC, BIU increased by 0.319 units.

**Table 62 Coefficients**

		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	1.290	.363		3.558	.000
	PE	.107	.060	.103	1.790	.075
	EE	.326	.063	.337	5.152	.000
	SI	.032	.034	.046	.949	.344
	FC_Final	.356	.071	.319	4.988	.000

a. Dependent Variable: BI

The p-value shows how strong of evidence in support of accepting or rejecting the null hypothesis. For those variables whose p-value is 0.000, we can reject the null hypothesis that there is no relationship between them and the independent variable; thus we can conclude that there are relationships between EE, FC and the BI whereas PE, SI do not have any relations with BI.

However and because the researcher will also test the moderating effect of some other independent variables on the relationships of PE, EE, SI, FC and BI, the researcher also applied scenario number two resorting to simple linear regression tests to test not just the strength of the model as a whole but also the strength of the relationships of each of the independent variables with the dependent variable and how the moderators affect this relationship. For the individual relations between the independent variables and the dependent variable, the results came as follow:

Between PE and BI, R square is .200 (please check Table 35 above), and that is 20% of the variance in Behavioral intention was predicted from Performance Expectancy.  $P=0000$  which means we reject the null hypothesis and conclude that there is a relationship between PE and BI.

Between EE and BI, R square is .368 (please check Table 38 above), and that is 36.8% of the variance in Behavioral intention was predicted from Effort Expectancy.  $P=0.000$  thus the null hypothesis is rejected and the conclusion is that there is a relationship between EE and BI.

Between SI and BI, R square is .023 (please check Table 41 above), and that is 2.3% of the variance in Behavioral intention was predicted from Social Influence.  $P=0.016$  thus the null hypothesis is rejected and the conclusion is that there is a relationship between SI and BI.

Between FC and BI, R square is .354 (please check Table 47 above), and that is 35.4% of the variance in Behavioral intention was predicted from the final Facilitating conditions.  $P=0.000$  thus the null hypothesis is rejected and the conclusion is that there is a relationship between FC and BI. When the relationships between the several independent variables PE, EE, SI and FC and the dependent variable BI were studied through a multiple linear regression, the R square showed that 44.8 % of the variance of the dependent variable which is the BI is explained by the independent variables PE, EE, SI and FC.

The individual predictors were then examined further.

PE was not a significant predictor of BIU,  $B = 0.106$ ,  $p = 0.079$ ; EE was a significant predictor of BIU,  $B = 0.323$ ,  $p = 0.00$  suggesting that for every one-unit increase in EE, BIU increased by 0.323 units. SI was not a significant predictor of BIU,  $B = 0.029$ ,  $p = 0.425$ . FC extended was a significant predictor of BI,  $B=0.347$ ,  $p= 000$  suggesting that for every one-unit increase in EE, BIU increased by 0.347.

#### **4.8.2 Testing the moderating effect of Group Work Effectiveness on the relationship between Performance Expectancy and Users' Behavioral Intention to attend MOOCs**

##### **Hypothesis 2**

**H2:** The relationship between Performance Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between PE and BI.

The aim of testing whether or not the second hypothesis is supported is to check the moderation impact of Group Work Effectiveness on the relationship between the independent variable, Performance Expectancy, and the dependent variable, Behavioral intention to attend MOOCs. A moderator represents a third variable that has an effect on the magnitude and strength of the relationship between the independent variable and the dependent variable. If a correlation relationship exists between these variables, (PE and BI) then it is safe to proceed with testing the moderation variable impact.

Before proceeding with the analysis and incorporating the moderator variable (Group work Effectiveness GWE) with the independent variable (Performance Expectancy PE), it was important to check the inter correlation of these variables as well as identifying the existence of multi-collinearity (Hayes, 2013). The researcher performed a bivariate correlation analysis through SPSS. As the result showed, an acceptable correlation existed as shown in Table 63 thus, the researcher proceeded with the two-step regression test.

**Table 63 correlation PE, GWE, BI, GWE X PE**

		Correlations			
		BI	GWE	GWE_X_PE	PE
BI	Pearson Correlation	1	.266**	.380**	.448**
	Sig. (2-tailed)		.000	.000	.000
	N	253	253	253	253
GWE	Pearson Correlation	.266**	1	.900**	.393**
	Sig. (2-tailed)	.000		.000	.000
	N	253	253	253	253
GWE_X_PE	Pearson Correlation	.380**	.900**	1	.725**
	Sig. (2-tailed)	.000	.000		.000
	N	253	253	253	253
PE	Pearson Correlation	.448**	.393**	.725**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	253	253	253	253

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

To study Group work effectiveness and its effect on the relationship between Performance expectancy and the behavioral intention of professionals to attend MOOCs, first the simple linear

regression between PE and BI shows a 20% variance in the BI. However when the PE X GWE effect was tested, it showed a slight variance. The model was significant but the coefficient of PE X GWE was not. To elaborate more, a linear regression test between the independent variable, Performance expectancy and the dependent variable behavioral intention of professionals to attend MOOCs and the moderator variable, Group Work Effectiveness was conducted. The test requires a two-step method and thus it was divided into two main steps.

In the first step, the SPSS software took the independent variable, the Performance Expectancy and the moderating variable, Group Work Effectiveness variable and entered them into the first equation in the regression table factor. As a second step, the product of the multiplication of the two variables, Performance Expectancy and Group work Effectiveness were also added to the equation (Performance Expectancy X Group work Effectiveness) having Behavioral Intention as the dependent variable and this is to investigate the impact of the moderator variable on the independent variable. Using the built-in function ‘transform’ in the SPSS, a new variable was created which is the multiplication of the two variables, and the result of this process is seen in the tables below (see Tables 64 for the model summary and Table 65 for the ANOVA test results):

**Table 64 Group Work Effectiveness as a moderator, PE/BI-Model summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.458 <sup>a</sup>	.210	.204	.894
2	.462 <sup>b</sup>	.213	.204	.894

a. Predictors: (Constant), GWE, PE

b. Predictors: (Constant), GWE, PE, GWE\_X\_PE

**Table 65 Group Work Effectiveness as a moderator, PE/BI-ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	53.024	2	26.512	33.194	.000 <sup>b</sup>
	Residual	199.672	250	.799		
	Total	252.696	252			
2	Regression	53.893	3	17.964	22.500	.000 <sup>c</sup>
	Residual	198.802	249	.798		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), GWE, PE

c. Predictors: (Constant), GWE, PE, GWE\_X\_PE

**Table 66 Group Work Effectiveness as a moderator, PE/BI-Coefficients**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.171	.370		8.563	.000
	PE	.422	.064	.406	6.636	.000
	GWE	.101	.058	.106	1.737	.084
2	(Constant)	2.228	.976		2.283	.023
	PE	.584	.167	.561	3.485	.001

GWE	.345	.242	.364	1.430	.154
GWE_X_PE	-.041	.040	-.355	-1.044	.298

a. Dependent Variable: BI

The model appears to improve slightly when the moderator is included as it can be seen from the R square that increased by 0.3% and the p from the ANOVA was significant. However, the next step shows a  $p > 0.05$  for coefficients and thus the researcher cannot reject the null hypothesis which means that the first hypothesis that states that “The relationship between Performance Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between PE and BI” is not supported.

#### **4.8.3 Testing the moderating effect of Group Work Effectiveness on the relationship between Effort Expectancy and the Behavioral intention of learners to attend MOOCs**

##### **Hypothesis 3**

**H3:** The relationship between Effort Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between EE and BI.

Testing whether or not the third hypothesis is supported aims to check the moderation impact of Group Work Effectiveness on the relationship between the independent variable, Effort Expectancy, and the dependent variable, Behavioral intention to attend MOOCs. A moderator represents a third variable that has an effect on the magnitude/strength and direction of the relationship between the independent variable and the dependent variable. If a correlation relationship exists between these variables (EE and BI), then it is safe to proceed with testing the moderation variable impact.

Before proceeding with the analysis and incorporating the moderator variable (Group work Effectiveness - GWE) with the independent variable (Effort Expectancy - EE), it is important to

check the inter correlation of these variables as well as identifying the existence of multicollinearity (Hayes, 2013). The researcher performed a bivariate correlation test through SPSS. As the result showed, an acceptable correlation existed as shown in Table 67. Thus, the researcher can proceed with the two-step regression test.

**Table 67 Group Work Effectiveness, EE, BI and Correlations**

		Correlations			
		EE	BI	GWE	GWE_X_EE
EE	Pearson Correlation	1	.606**	.268**	.688**
	Sig. (2-tailed)		.000	.000	.000
	N	253	253	253	253
BI	Pearson Correlation	.606**	1	.266**	.464**
	Sig. (2-tailed)	.000		.000	.000
	N	253	253	253	253
GWE	Pearson Correlation	.268**	.266**	1	.865**
	Sig. (2-tailed)	.000	.000		.000
	N	253	253	253	253
GWE_X_EE	Pearson Correlation	.688**	.464**	.865**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	253	253	253	253

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

Therefore, for the effect of Group work effectiveness on the relationship between the independent variable Effort expectancy and the behavioral intention to attend MOOCs as dependent variable, the simple linear regression as a first step showed a 36.8% variance in the relation. The introduced moderator variable increased the relationship by 3% as seen in the R square in Table 68, the model table below.

**Table 68 Group Work Effectiveness as a moderator, EE/BI-Model Summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616 <sup>a</sup>	.379	.374	.792
2	.639 <sup>b</sup>	.409	.401	.775

a. Predictors: (Constant), EE, GWE

b. Predictors: (Constant), EE, GWE, GWE\_X\_EE

**Table 69 Group Work Effectiveness as a moderator, EE/BI-ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	95.783	2	47.891	76.302	.000 <sup>b</sup>
	Residual	156.913	250	.628		
	Total	252.696	252			
2	Regression	103.233	3	34.411	57.328	.000 <sup>c</sup>
	Residual	149.462	249	.600		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), EE, GWE

c. Predictors: (Constant), EE, GWE, GWE\_X\_EE

**Table 70 Group Work Effectiveness as a moderator, EE/BI-Coefficients**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.348	.325		7.223	.000
	GWE	.105	.049	.111	2.145	.033
	EE	.556	.050	.577	11.143	.000
2	(Constant)	-.567	.887		-.640	.523
	GWE	.822	.209	.867	3.933	.000
	EE	1.044	.147	1.082	7.111	.000
	GWE_X_EE	-.119	.034	-1.030	-3.523	.001

a. Dependent Variable: BI

To elaborate more, a linear regression test between the independent variable, Effort Expectancy and the dependent variable behavioral intention of professionals to attend MOOCs and the moderator variable, Group Work Effectiveness was conducted. The test requires a two-step method and thus it was divided into two main steps.

In the first step, the SPSS software took the independent variable, the Effort Expectancy and the moderating variable, Group Work Effectiveness variable and entered them into the first equation in the regression table factor. As a second step, the multiplication of the two variables, Effort Expectancy and Group work Effectiveness were also added to the equation (Effort Expectancy X Group work Effectiveness) having Behavioral Intention as the dependent variable. This is to investigate the impact of the moderator variable on the independent variable. Using the built-in function 'transform' in the SPSS, a new variable was created which is the multiplication product of the two variables, and the result of this process is seen in the tables above (see Tables 68 for the model summary and Table 69 for the ANOVA test results. These show that the model is significant, and table 70 (Coefficients) shows that the variables' relationships are significant. Thus we can conclude that the null hypothesis is rejected and then hypothesis 3 that states that "The relationship between Effort Expectancy and Behavioral Intention is moderated by Group Work

Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between EE and BI” is supported.

#### 4.8.4 Testing the moderating effect of Group Work Effectiveness on the on the relationship between Social Influence and the Behavioral intention of learners to attend MOOCs

##### Hypothesis 4

**H4:** The relationship between Effort Social Influence and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between SI and BI.

The aim of testing the fourth hypothesis is to check the moderation impact of Group Work Effectiveness on the relationship between the independent variable, Social influence, and the dependent variable, Behavioral Intention to attend MOOCs. GWE as a moderator, represents a third variable that might have an effect on the magnitude/strength and direction of the relationship between the independent variable and the dependent variable. If a correlation relationship exists between these variables, (SI and BI) then it is safe to proceed with testing the moderation variable impact.

Before proceeding with the analysis and incorporating the moderator variable (Group work Effectiveness GWE) with the independent variable (Social influence SI), it is important to check the inter correlation of these variables as well identifying the existence of multi collinearity (Hayes, 2013). The researcher performed a bivariate correlation through SPSS. The results showed an acceptable correlation existed as shown in Table 71 thus, the researcher proceeded with the two-step regression test.

**Table 71 Group Work Effectiveness as a moderator, SI, BI and Correlations**

		Correlations		
		SI	BI	GWE_X_SI
SI	Pearson Correlation	1	.152*	.924**
	Sig. (2-tailed)		.016	.000
	N	253	253	253
BI	Pearson Correlation	.152*	1	.212**
	Sig. (2-tailed)	.016		.001

	N	253	253	253
GWE_X_SI	Pearson Correlation	.924**	.212**	1
	Sig. (2-tailed)	.000	.001	
	N	253	253	253

\*. Correlation is significant at the 0.05 level (2-tailed).

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

Group work effectiveness effect on the relationship between Social Influence and the behavioral intention of professionals to attend MOOCs was studied. First, the simple linear regression between SI and BI shows a 2.3% variance in the BI; however, in the multiple linear regression test, when the SI X GWE effect was tested, it showed no variance. The model was significant but the coefficient of SI X GWE was not. To elaborate more, a linear regression test between the independent variable, Social influence and the dependent variable Behavioral Intention of professionals to attend MOOCs and the moderator variable, Group Work Effectiveness was conducted. The test requires a two-step method and thus it was divided into two main steps.

In the first step, the SPSS software took the independent variable, the Social influence and the moderating variable, Group Work Effectiveness variable and entered them into the first equation in the regression table factor. As a second step, the product of the multiplication of the two variables, Social Influence and Group work Effectiveness was also added to the equation (Social Influence X Group work Effectiveness) having Behavioral Intention as the dependent variable and this is to investigate the impact of the moderator variable on the independent variable. Using the built-in function 'transform' in the SPSS, a new variable was created which is the multiplication product of the two variables. The result of this process is seen in the tables below (see Tables 72 for the model summary and Table 73 for the ANOVA test results):

**Table 72 Group Work Effectiveness as a moderator, SI/BI-Model Summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.269 <sup>a</sup>	.072	.065	.968

2	.269 <sup>b</sup>	.072	.061	.970
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a. Predictors: (Constant), SI, GWE

b. Predictors: (Constant), SI, GWE, GWE\_X\_SI

**Table 73 Group Work Effectiveness as a moderator, SI/BI-ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.274	2	9.137	9.744	.000 <sup>b</sup>
	Residual	234.421	250	.938		
	Total	252.696	252			
2	Regression	18.278	3	6.093	6.472	.000 <sup>c</sup>
	Residual	234.417	249	.941		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), SI, GWE

c. Predictors: (Constant), SI, GWE, GWE\_X\_SI

**Table 74 Group Work Effectiveness as a moderator, SI/BI-Coefficients**

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		

1	(Constant)	4.941	.277		17.859	.000
	GWE	.233	.064	.246	3.646	.000
	SI	.032	.048	.045	.673	.502
2	(Constant)	4.908	.578		8.488	.000
	GWE	.240	.124	.254	1.939	.054
	SI	.043	.174	.061	.248	.805
	GWE_X_SI	-.002	.034	-.020	-.066	.948

a. Dependent Variable: BI

Thus we can conclude that the null hypothesis is not accepted and then hypothesis 4 that states that “The relationship between Social Influence and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between SI and BI” is not supported.

#### **4.8.5 Testing the moderating effect of Social Perceptiveness on the relationship between Effort Expectancy and the behavioral intention to attend MOOCs**

##### **Hypothesis 5**

**H5:** The relationship between Effort Expectancy and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between SI and BI.

Testing whether or not the fifth hypothesis is supported aims to check the moderation impact of Social Perceptiveness on the relationship between the independent variable, Effort Expectancy, and the dependent variable, Behavioral intention to attend MOOCs. Social Perceptiveness as a moderator, represents a third variable that might have an effect on the magnitude/strength and direction of the relationship between the independent variable and the dependent variable. If a correlation relationship exists between these variables (Social Perceptiveness and BI), then it is safe to proceed with testing the moderation variable impact.

Before proceeding with the analysis and incorporating the moderator variable (Social Perceptiveness) with the independent variable (Effort Expectancy), it was important to check the

inter correlation of these variables as well as identifying the existence of multi-collinearity (Hayes, 2013). The researcher performed a bivariate correlation through SPSS. The results show, an acceptable correlation existed as shown in Table 75. Thus, the researcher proceeded with the two-step regression test.

**Table 75 Social perceptiveness as a moderator, EE, BI and Correlations**

		Correlations		
		EE	BI	Grade_X_EE
EE	Pearson Correlation	1	.606**	.648**
	Sig. (2-tailed)		.000	.000
	N	253	253	253
BI	Pearson Correlation	.606**	1	.389**
	Sig. (2-tailed)	.000		.000
	N	253	253	253
Grade_X_EE	Pearson Correlation	.648**	.389**	1
	Sig. (2-tailed)	.000	.000	
	N	253	253	253

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

**Social Perceptiveness (Graded RME Test) x EE**

For social perceptiveness, the researcher administered a test that was conducted online; it is the Reading the Mind in the Eyes experience that tests the Theory of Mind and how much perceptiveness and emotional intelligence the respondents have. The social perceptiveness has a 5 % increase effect on the relationship between the independent and dependent variables.

Social Perceptiveness effect on the relationship between Effort Expectancy and the Behavioral Intention of professionals to attend MOOCs was studied. First, the simple linear regression between EE and BI shows a 36.8% variance in the BI. However, when the EE X Social Perceptiveness effect was tested it showed a 0.4 increase. The model was significant but the coefficient of EE X Social Perceptiveness was not. To elaborate more, a linear regression test between the independent variable, Effort Expectancy and the dependent variable behavioral

intention of professionals to attend MOOCs and the moderator variable, Social Perceptiveness was conducted. The test requires a two-step method and thus it was divided into two main steps.

In the first step, the SPSS software took the independent variable, the Effort Expectancy and the moderating variable, Social Perceptiveness variable and entered them into the first equation in the regression table factor. As a second step, the product of the multiplication of the two variables, Effort Expectancy and Social Perceptiveness was also added to the equation (Effort Expectancy X Social Perceptiveness) having Behavioral Intention as the dependent variable and this is to investigate the impact of the moderator variable on the independent variable. Using the built-in function ‘transform’ in the SPSS, a new variable was created which is the multiplication product of the two variables, and the result of this process is seen in the tables below (see Tables ?? for the model summary and Table 77 for the ANOVA test results):

**Table 76 Social Perceptiveness as a moderator, EE/BI-Model Summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.606 <sup>a</sup>	.368	.363	.799
2	.611 <sup>b</sup>	.373	.366	.798

a. Predictors: (Constant), EE, Grades

b. Predictors: (Constant), EE, Grades , Grade\_X\_EE

**Table 77 Social Perceptiveness as a moderator, EE/BI-ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	92.931	2	46.465	72.709	.000 <sup>b</sup>

	Residual	159.765	250	.639		
	Total	252.696	252			
2	Regression	94.326	3	31.442	49.436	.000 <sup>c</sup>
	Residual	158.369	249	.636		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), EE, Grades

c. Predictors: (Constant), EE, Grades , Grade\_X\_EE

**Table 78 Social Perceptiveness as a moderator, EE/BI-Coefficients**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.616	.364		7.188	.000
	Grades	.002	.010	.012	.240	.811
	EE	.584	.049	.605	11.991	.000
2	(Constant)	1.291	.965		1.338	.182
	Grades	.063	.042	.318	1.496	.136
	EE	.816	.164	.846	4.974	.000
	Grade_X_EE	-.010	.007	-.412	-1.481	.140

a. Dependent Variable: BI

Thus we can conclude that the null hypothesis is accepted and that hypothesis 5 that states that “The relationship between Effort Expectancy and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between EE and BI” is not supported.

#### 4.8.6 Testing the moderation effect of Social Perceptiveness on the relationship between Social influence and the Behavioral Intention to attend MOOCs

##### Hypothesis 6

**H6:** The relationship between Social Influence and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between SI and BI.

Testing whether or not the sixth hypothesis is supported aims to check the moderation impact of Social Perceptiveness on the relationship between the independent variable, Social Influence, and the dependent variable, Behavioral intention to attend MOOCs. Social Perceptiveness as a moderator, represents a third variable that might have an effect on the magnitude/strength and direction of the relationship between the independent variable and the dependent variable. If a correlation relationship exists between these variables, then it is safe to proceed with testing the moderation variable impact.

Before proceeding with the analysis and incorporating the moderator variable (Social Perceptiveness) with the independent variable (Social Influence), it is important to check the inter correlation of these variables as well as identifying the existence of multi-collinearity (Hayes, 2013). The researcher performed a bivariate correlation through SPSS. The results show that an acceptable correlation existed as shown in Table 79. Thus, the researcher proceeded with the two-step regression test.

**Table 79 Social Perceptiveness, BI, SI and correlations**

Correlations				
		BI	SI	Grade_X_SI
BI	Pearson Correlation	1	.152*	.134*

	Sig. (2-tailed)		.016	.033
	N	253	253	253
SI	Pearson Correlation	.152*	1	.813**
	Sig. (2-tailed)	.016		.000
	N	253	253	253
Grade_X_SI	Pearson Correlation	.134*	.813**	1
	Sig. (2-tailed)	.033	.000	
	N	253	253	253

\*. Correlation is significant at the 0.05 level (2-tailed).

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

Concerning the effect of Social Perceptiveness on the relationship between Social influence and the behavioral intention to attend MOOCs, the model showed a 2.3% variance. The moderator effect seems to be increasing the strength of the relationship. To elaborate more, a linear regression test between the independent variable, Social Influence and the dependent variable behavioral intention of professionals to attend MOOCs and the moderator variable, Social Perceptiveness was conducted. The test requires a two-step method and thus it was divided into two main steps.

In the first step, the SPSS software took the independent variable, the Social Influence and the moderating variable, Social Perceptiveness variable and entered them into the first equation in the regression table factor. As a second step, the product of the multiplication of the two variables, Social Influence and Social Perceptiveness was also added to the equation (Social Influence X Social Perceptiveness) having Behavioral Intention as the dependent variable and this is to investigate the impact of the moderator variable on the independent variable. Using the built-in function 'transform' in the SPSS, a new variable was created which is the multiplication product of the two variables. The result of this process is seen in the tables below (see Tables 80 for the model summary and Table 81 for the ANOVA test results):

**Table 80 Social Perceptiveness as a moderator, SI/BI-Model summary**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.185 <sup>a</sup>	.034	.026	.988
2	.249 <sup>b</sup>	.062	.051	.976

a. Predictors: (Constant), SI, Grades

b. Predictors: (Constant), SI, Grades , Grade\_X\_SI

**Table 81 Social Perceptiveness as a moderator, SI/BI-ANOVA**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.633	2	4.316	4.421	.013 <sup>b</sup>
	Residual	244.063	250	.976		
	Total	252.696	252			
2	Regression	15.701	3	5.234	5.499	.001 <sup>c</sup>
	Residual	236.995	249	.952		
	Total	252.696	252			

a. Dependent Variable: BI

b. Predictors: (Constant), SI, Grades

c. Predictors: (Constant), SI, Grades , Grade\_X\_SI

**Table 82 Social Perceptiveness as a moderator, SI/BI-Coefficients**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.200	.378		13.763	.000
	Grades	.022	.013	.109	1.701	.090
	SI	.127	.045	.179	2.789	.006
2	(Constant)	3.628	.687		5.279	.000
	Grades	.089	.028	.452	3.209	.002
	SI	.556	.164	.785	3.395	.001
	Grade_X_SI	-.019	.007	-.639	-2.725	.007

a. Dependent Variable: BI

To study if the increase in social perceptiveness also affects the relationship of these two variables, the researcher resorted to splitting the file for the grade-s according into categories that were pre-determined, and here are the results. The statistically significant results are the ones of grade categories (17-20) and above. The grades between 13 and 16, and less than 12, did not show any statistical significance.

**Table 83 Grades split according to Age categories-Model Summary**

Model Summary					
Grades-Interval	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
less than 12	1	.658 <sup>a</sup>	.433	.291	2.044
	2	.663 <sup>b</sup>	.439	.199	2.172
13 to 16	1	.706 <sup>a</sup>	.499	.298	.633
	2	.758 <sup>b</sup>	.575	.256	.652
17 to 20	1	.685 <sup>a</sup>	.469	.427	.564
	2	.787 <sup>b</sup>	.619	.572	.487
21 to 24	1	.384 <sup>a</sup>	.147	.117	.630

	2	.386 <sup>b</sup>	.149	.102	.636
25 to 28	1	.610 <sup>a</sup>	.372	.359	.707
	2	.612 <sup>b</sup>	.374	.355	.709
29 to 32	1	.580 <sup>a</sup>	.337	.298	.826
	2	.598 <sup>b</sup>	.357	.299	.825
33 to 36	1	.751 <sup>a</sup>	.564	.346	1.116
	2	.996 <sup>b</sup>	.992	.984	.172

a. Predictors: (Constant), EE, Grades

b. Predictors: (Constant), EE, Grades , Grade\_X\_EE

**Table 84 Grades split according to Age categories-ANOVA**

ANOVA <sup>a</sup>							
Grades-Interval	Model		Sum of Squares	Df	Mean Square	F	Sig.
less than 12	1	Regression	25.482	2	12.741	3.049	.104 <sup>b</sup>
		Residual	33.428	8	4.178		
		Total	58.909	10			
	2	Regression	25.881	3	8.627	1.828	.230 <sup>c</sup>
		Residual	33.028	7	4.718		
		Total	58.909	10			
13 to 16	1	Regression	1.995	2	.997	2.487	.178 <sup>b</sup>
		Residual	2.005	5	.401		
		Total	4.000	7			
	2	Regression	2.299	3	.766	1.801	.286 <sup>c</sup>
		Residual	1.701	4	.425		
		Total	4.000	7			
17 to 20	1	Regression	7.018	2	3.509	11.041	.000 <sup>b</sup>
		Residual	7.946	25	.318		
		Total	14.964	27			
	2	Regression	9.270	3	3.090	13.024	.000 <sup>c</sup>
		Residual	5.694	24	.237		
		Total	14.964	27			
21 to 24	1	Regression	3.840	2	1.920	4.830	.012 <sup>b</sup>
		Residual	22.261	56	.398		
		Total	26.102	58			
	2	Regression	3.881	3	1.294	3.202	.030 <sup>c</sup>
		Residual	22.220	55	.404		

		Total	26.102	58			
25 to 28	1	Regression	29.557	2	14.779	29.583	.000 <sup>b</sup>
		Residual	49.957	100	.500		
		Total	79.515	102			
	2	Regression	29.755	3	9.918	19.733	.000 <sup>c</sup>
		Residual	49.760	99	.503		
		Total	79.515	102			
29 to 32	1	Regression	11.782	2	5.891	8.637	.001 <sup>b</sup>
		Residual	23.191	34	.682		
		Total	34.973	36			
	2	Regression	12.490	3	4.163	6.111	.002 <sup>c</sup>
		Residual	22.483	33	.681		
		Total	34.973	36			
33 to 36	1	Regression	6.444	2	3.222	2.586	.190 <sup>b</sup>
		Residual	4.984	4	1.246		
		Total	11.429	6			
	2	Regression	11.339	3	3.780	127.095	.001 <sup>c</sup>
		Residual	.089	3	.030		
		Total	11.429	6			

a. Dependent Variable: BI

b. Predictors: (Constant), EE, Grades

c. Predictors: (Constant), EE, Grades , Grade\_X\_EE

## 4.9 Conclusion

Chapter 4 presented the research findings and analysis of the quantitative data analysis. First, the researcher presented the descriptive analysis and then the reliability and validity analysis as well as the presentation of correlation results and multiple linear regression analyses, and then the chapter ended with a report about the results of the hypotheses testing.

## **Chapter Five- Discussion**

### **5.1 Introduction**

In chapter five, the researcher summarizes and discusses the findings from chapter 4 and link them to research and studies conducted by previous scholars to pave the way for the conclusion, recommendations and contribution to research that will be elaborated in the last chapter of this thesis, chapter six.

### **5.2 Summary of the Findings**

The quantitative research and the test that was administered resulted in conclusions concerning the hypotheses that were derived and tested. Below are the results.

- The first hypothesis that states that “Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions positively affect behavioral intentions to attend MOOCs” is investigated. The results show that there is a strong positive correlation and relationships between the variables; thus, the researcher concludes that H1 is supported.
- The second hypothesis that states that “ the relationship between Performance Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between PE and BI” is investigated. The results show there is no moderating effect for Group Work Effectiveness. Thus, the researcher concludes that H2 is not supported.
- The third hypothesis that states that “The relationship between Effort Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between EE and BI” is investigated. The results show there is a moderating effect for Group Work Effectiveness. Thus, the researcher concludes that H3 is supported.
- The fourth hypothesis that states that “The relationship between Social Influence and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between

SI and BI” is investigated. The results show there is no moderating effect for Group Work Effectiveness. Thus, the researcher concludes that H4 is not supported.

- The fifth hypothesis that states that “The relationship between Effort Expectancy and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between EE and BI” is investigated. The results show there is no moderating effect for Social Perceptiveness. Thus, the researcher concludes that H5 is not supported.
- The sixth hypothesis that states that “The relationship between Social Influence and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between SI and BI” is investigated. The results show there is a moderating effect for Social Perceptiveness. Thus, the researcher concludes that H6 is supported.

### **5.3 Interpretations of the results**

#### **5.3.1 Interpretation of the results of Hypothesis 1**

**H1: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions will positively affect behavioral intentions to attend MOOCs.**

The first hypothesis assumes that there are relationships between the independent variables and the dependent variable; i.e. Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions will positively affect behavioral intentions to attend MOOCs. After testing this hypothesis, results of the several tests used showed that this hypothesis is supported. When the relationships between the several independent variables PE, EE, SI and FC and the dependent variable BI were studied through a multiple linear regression, the R square showed that 44.8 % of the variance of the dependent variable which is the BI is explained by the independent variables PE, EE, SI and FC.

The individual predictors were then examined further, and results showed that PE and SI were not significant predictors of BIU while EE was a significant predictor of BIU suggesting that for every one-unit increase in EE, BIU increased by 0.323 units. The same result for FC extended which

was a significant predictor of BI suggesting that for every one-unit increase in EE, BIU increased by 0.347.

To interpret this result further, and because in other hypotheses the moderating effect of some variables on the independent- dependent relation will be studied, these relationships will be studied individually. The results showed that each of the variables had a relative effect on the relationship and the degree of this effect differs from one variable to another. Basically all of the independent variables Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions had positive effects on learners' behavioral intention to use MOOCs. To be more specific, studying the relationship between PE and BI, the simple linear regression showed an R square of 0.200; thus, the Performance Expectancy by itself predicted 20 % of the variance of the behavioral intention of users to attend MOOCs.

The researcher was also able to deduce the equation for this prediction and it is as follows: For every increase of one unit in PE, BI will increase of .465 and the regression equation for predicting BI from PE is  $Y=3.384+0.465X$

Concerning the second independent variable Effort Expectancy, R square is .368, and thus 36.8% of the variance in Behavioral intention is predicted from Effort Expectancy. For every increase of one unit in PE, BI will increase of .585 and the regression equation for predicting BI from EE is  $Y=2.668 +0.585X$

For Social Influence, R square is .023, and thus 2.3% of the variance in Behavioral intention is predicted by Social Influence. For every increase of one unit in SI, BI will increase of .107 and the regression equation for predicting BI from EE is  $Y=5.787 +0.107X$ .

As for the Facilitating Conditions, the researcher performed a simple linear regression and the R square showed that only 15.6% of the variance in Behavioral intention is predicted from the original Facilitating conditions; however, with the extended Facilitating conditions and with the two additional components Time flexibility and Continuous Availability, the prediction of variance in Behavioral intention increased to 35.4%.

To sum things up, Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions have positive effects on learners' behavioral intention to use MOOCs. Although the UTAUT model is very popular, there is a limited number of research and studies that have used it

to study and investigate MOOCs adoption and acceptance by learners. The findings of this research comes in harmony with some of the previous studies while it contradicts the findings of some of them.

To explore some of the factors that affect students' usage of MOOCs, Fianu et al. (2018) used UTAUT model. The findings pointed that the intention to use MOOCs is influenced by Performance Expectancy. While the result of this research agrees with this finding, it contradicts with the rest of the findings that showed that Social Influence and Effort Expectancy do not have any effect on Performance Expectancy.

Mulik et al. (2018) studied MOOCs adoption by extending the UTAUT model. The results, and like the results of this research, showed that all the four factors have an effect on the intention to use MOOCs. This is also backed by the findings of Nordin et al. (2015) who studied technology acceptance toward MOOCs. In their results, they revealed that all four factors of the UTAUT model had positive effects.

According to Venkatesh et al. (2003), PE, EE and SI have positive effects on users' behavioral intention. However, and while the previously mentioned authors didn't find a relationship between FC and BI, the findings of this research show that in addition to the previously mentioned variables, the Facilitating conditions also play a role, especially the extended FC that the researcher extended to include time flexibility and continuous availability. This comes in line with the findings of Zhou, et al. (2010) and Yoo, et al. (2012) whose research findings have shown that the facilitating conditions have an impact on the behavioral intention of learners to adopt and accept e-learning. In fact Yoo, et al. (2012) studied e-learning in the workplace and the results showed that the behavioral intention was affected by Performance expectancy, social influences, and facilitating conditions as components of extrinsic motivation and effort expectancy as a component of intrinsic motivation.

When it comes to the finding of this research, it shows that MOOCs, like E-learning is a special form of Technology and the factors that might affect its acceptance among learners might vary compared to other forms of technology, so while in some technologies not all four UTAUT's independent variables played a role, in our research it was shown that all of them played a role, and in fact the role of the Facilitating Conditions is even better shown and better predicted through the extended statements that test the roles of Time flexibility and continuous availability.

### **5.3.2 Interpretation of the Results of Hypothesis 2**

**H2:** The relationship between Performance Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between PE and BI.

The aim of testing whether or not the second hypothesis is supported is to check the moderation impact of Group Work Effectiveness on the relationship between the independent variable, Performance Expectancy, and the dependent variable, Behavioral intention to attend MOOCs.

Investigating the effect of Group Work Effectiveness as a moderator on the relationship between Performance Expectancy and Behavioral intentions of learners to attend MOOCs shows the Group Work Effectiveness has no effect. This contradicts with Ekblaw (2016)'s findings who believe that group work and learning through projects in online learning have an important effect as such that they improve group dynamics and help in reaching a deeper level of understanding as well as fostering a higher level of cognitive abilities. According to Liang, et al. (2010), Team Climate influences user's behaviors by changing their cognitive perceptions rather than their normative beliefs.

Chattopadhyay (2014) believes that MOOCs have been effective and have been affected with some of the critical 21<sup>st</sup> Century skills like collaboration, self-driven learning, sense-making... etc. This does not come in line with this research findings concerning this hypothesis.

While Performance Expectancy has an effect on behavioral intention to use MOOCs, this relationship seems unaffected by Group Work Effectiveness; that is to say that whether they are working in groups or individually, and regardless of whether this group performance is effective or not, the learners' intention does not get affected. The explanation of this finding is that Performance Expectancy is individual by nature, and by definition, it is a belief that the use of a particular technology will be advantageous or performance-enhancing to the individual. Thus, most learners will look at it from their own point of view and personal interest, regardless of what others in the team think. Moreover, most of those who are attending MOOCs, especially in the case of this study, are professionals who are doing so for professional individual enhancement. They are from different countries located in different regions and not a group of professionals from

the same company or organization. This comes in line with the findings of Larson (2010) who claims that the effectiveness of a team's performance is related to the outcome, and the learners in this research do not share the same outcome even if it is similar.

### **5.3.3 Interpretation of the Results of Hypothesis 3**

**H3:** The relationship between Effort Expectancy and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between EE and BI.

Testing whether or not the third hypothesis is supported aims to check the moderation impact of Group Work Effectiveness on the relationship between the independent variable, Effort Expectancy, and the dependent variable, Behavioral intention to attend MOOCs.

Many studies have confirmed the existence of a significant relationship between Effort Expectancy and User Intention to adopt MOOCs. Wan et al. (2020)'s results showed that Effort Expectancy was a crucial predictor of learners' continued intention. Contrary to these results, other scholars report that Effort Expectancy did not have any prediction effect on teacher's usage of MOOCs (Tsenga, et al., 2019).

Effort Expectancy in this research is related to the learner's expectation toward ease. Authors like Zhou et al. (2010) demonstrated that users who feel that the technology they are using is easy to use and does not require much effort, would have higher chances to adopt and use this form of technology than those who don't.

The conclusion from this research hypothesis can be an explanation for the results above. Group Work Effectiveness can influence or increase the effect of Effort Expectancy and thus makes the learners more inclined to attend and finish MOOCs; students from Wan et al. (2020)'s study worked as a team and this Group Work would make them perceive using MOOCs as easy to use; whereas teachers in Tsenga et al. (2019)'s study were working individually so this might have affected their Behavioral Intention to use MOOCs. According to Ellis (2002), working with a peer or peers in contrast to working alone for teachers' technology training is more effective. The author postulates peer-to-peer training as an effective model to increase teachers' technological competency. Working in a group can make things easier and can help technology users perceive this technology as user friendly. Cheung and Vogel (2013) explored collaborative technologies for

e-learning. They concluded that peer influence plays a role in the acceptance of e-learning technology. According to Ingram (2000) teamwork is a strategy that has a potential to improve the performance of individuals and organizations. All these findings of aforementioned scholarly works come in line with the results of this research.

#### **5.3.4 Interpretation of the Results of Hypothesis 4**

**H4:** The relationship between Social Influence and Behavioral Intention is moderated by Group Work Effectiveness such that when Group Work Effectiveness increases, its moderation effect creates a stronger relationship between SI and BI.

The aim of testing the fourth hypothesis is to check the moderation impact of Group Work Effectiveness on the relationship between the independent variable, Social influence, and the dependent variable, Behavioral Intention to attend MOOCs.

According to this research, Group work effectiveness does not have any effect on the weak relationship between Social Influence and the behavioral intention to use MOOCs. Like the results of many previous studies, the results of this research showed a relation between Social influence and the behavioral intention to use a technology, especially E-learning (Zhenghao, et al., 2015); (Wan, et al., 2020). By definition, Social Influence is “the degree to which an individual perceives that important others believe he or she should use the new system”. Although other scholars report them to be influential when it comes to attending MOOCs, and although cooperative and collaborative group work have positive effects on academic and social outcomes (Slavin, et al., 2003), these variables do not affect the relationship between Social Influence and Behavioral Intention to attend MOOCs, as this can be seen in the findings of this study.

When tackling Group Work effectiveness and Team Work, it is important to mention the concept of social loafing. The term was coined in the late 70’s by Latane et al. in one of their research. The authors believe that social loafing, or the tendency of individuals to put forth less effort when they are part of a group, is more likely to occur when individuals cannot perceive that their outputs cannot be evaluated collectively and would rather be evaluated individually (Latane, et al, 1976). This can explain why Group work Effectiveness does not have an effect in this particular setting since the learners come from different background and they know that their evaluation will rather be individual and not collective. Social Influence does not have an effect in the case of using MOOCs who will not be evaluated collectively.

An explanation of this can be that the respondents are professionals but they neither work together nor share the same professions. Therefore, coworkers or the organization in which they are working did not influence their choices to choose the specific MOOCs they have chosen.

### **5.3.5 Interpretation of the Results of Hypothesis 5**

**H5:** The relationship between Effort Expectancy and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between SI and BI.

Testing whether or not the fifth hypothesis is supported aims to check the moderation impact of Social Perceptiveness on the relationship between the independent variable, Effort Expectancy, and the dependent variable, Behavioral intention to attend MOOCs.

Social Perceptiveness, and according to the results in this research, appears not to have any moderating effect on the relationship between Effort Expectancy and the behavioral intention to use MOOCs. In other words, for one's intention to use a MOOC, it does not matter how much a person has the ability to understand the feelings of the people surrounding him/her. This has no effect on increasing what he/she already thinks about the effort he/she is going to dedicate to adopt a certain technology and here the effort is the effort exerted to attend MOOCs. Some researchers believe that if a person is capable of understanding others' emotions and the message conveyed through these emotions, then his/her capacity to reason becomes greater and more important (Salovey & Mayer, 1990). This does not seem to be true when it comes to perceiving how much effort they will be dedicating to adopt and use a certain technology, specifically for attending MOOCs.

Several studies have looked at the content of social perception on the comparisons that are made across multiple and relevant dimensions (Fiske, Cuddy, & Glick, 2007). According to Zaccaro, Gilbert, Thor, & Mumford (1991), organizational members who have high social perceptiveness are able to accurately perceive the social situation and determine the requirements of the social context. This does not echo the finding of this research that shows social perceptiveness as having no effect on effort expectancy and Behavioral Intention to attend MOOCs.

### **5.3.6 Interpretation of the Results of Hypothesis 6**

**H6:** The relationship between Social Influence and Behavioral Intention is moderated by Social Perceptiveness such that when Social Perceptiveness increases, its moderation effect creates a stronger relationship between SI and BI.

Testing whether or not the sixth hypothesis is supported aims to check the moderation impact of Social Perceptiveness on the relationship between the independent variable, Social Influence, and the dependent variable, Behavioral intention to attend MOOCs.

Based on the results of this research, the relationship between Social Influence and the behavioral intention to attend MOOCs appears to be moderated by social perceptiveness. First, social influence has an influence on a user's behavioral intention to attend MOOCs. This result is consistent with previous findings in the field of e-learning (El-Masri & Tarhini, 2017; Tan, 2013) and also in the MOOCs context (Mulik et al., 2018; Nordin et al., 2015).

This relationship, and based on the result of this research, appears to be moderated by social perceptiveness so that the higher the score of a person on the Reading the Mind in the Eyes test, the more likely he/she will be attend a MOOC.

There appears to be a moderating effect for Social Perceptiveness on the relationship between Social Influence and the Behavioral Intention to attend MOOCs. So the more social perceptiveness an individual has, the higher is his/her perception of what others believe regarding his or her use of the new system or in this research case, attending MOOCs. This in turn would affect the respondent's intention to attend MOOCs.

## **5.4 Conclusion**

In chapter five, the researcher discussed the findings of the hypotheses testing from chapter 4 and linked them to previous studies conducted by scholars in preparation for the last chapter that will include the conclusion, recommendations and contribution to research.

## **Chapter Six- Conclusions, Limitations Directions for Future Research**

### **6.1 Introduction**

In chapter six, the researcher gives a conclusion to the research where implications along with limitations are thoroughly discussed.

The chapter starts with a summary of the findings and then the contribution of this research that are divided into theoretical and practical contributions.

The research limitations are also discussed before the researcher concludes with the future research directions.

### **6.2 Contribution to Research**

The results can help deduce certain contributions that the researcher divides in this part of the chapter into two major parts: the theoretical contribution and the practical contribution.

#### **6.2.1 Theoretical contribution**

When it comes to the theoretical contribution, the main contribution of this research pertains to the extension of the UTAUT model through the conceptual model that was designed and then tested, and through the extension of one of the variables from the original model. The extension of the model was through adding and testing the effect of two new moderation mechanisms. The contribution is also through the extension of an already existing endogenous mechanism (Facilitating conditions) with the addition of sets of questions to further investigate the factors that form and affect this variable in particular

The first contribution is the conceptual model itself that studies the effect of Performance Expectancy, Effort Expectancy, Social Influence and Facilitating conditions on the behavioral intention of professionals to attend MOOCs. Results show that EE, PE, SI and FC accounted for 44.8% of the variance in the behavioral intentions of users to attend MOOCs with EE, FC having the strongest effect on the behavioral intentions of users. Not only this would be helpful addition to e-learning in general, it is also a novel addition to research on attending and accepting MOOCs.

The researcher also introduced and tested the moderating effect of two variables which are the Social Perceptiveness and Group Work Effectiveness using the UTAUT model. The original model is used to test the moderating effect of variables such as age, gender, experience... Currently, and in many cases, age and gender no longer play the same major role as they used to. Men and women of all ages have been interfacing with technology for a significant amount of time, so technological literacy can be found among all ages. This is a reason that should push researchers and scholar to try and find new moderators that can be affecting the acceptance of users and learners of a certain technology. Thus, the researcher attempts to be up to date with the changes in the world. This might not be applicable in all countries around the world, but since times are changing and technological advances and social equality are spreading, it would be normal to assume that things are also changing when it comes to the effect of certain variables such as age and gender compared to how things used to be when the model was originally designed. So based on this, and in attempt to be up to date, the researcher starts investigating new moderators that might also have an effect on these relationships between the independent variables and the dependent variable. To the author's knowledge, rare are the studies that have tested the effect of Social Perceptiveness and Group Work Effectiveness as moderating variables, especially using the UTAUT model. The results show that while Social Perceptiveness does not have any moderating effect on the relationship between Effort Expectancy and the Behavioral Intention to use MOOCs, it has an effect on the relationship between Social Influence and the Behavioral Intention to use MOOCs. In other words, the more social perceptiveness a person has, the better the relationship between Social Influence and the Behavioral Intention to use MOOCs becomes. Moreover, people with high social perceptiveness will have higher intention to attend MOOCs. When it comes to Group Work Effectiveness, it appears that its effect is mainly on the relationship between Effort Expectancy and the Behavioral Intention to use MOOCs. Group Work is perceived by the users as effective, and the more they work in an effective way as teams, the stronger the relationship between Effort Expectancy and the Behavioral intention to use MOOCs. Users who work in teams will see that using MOOCs will not require exerting too much effort, and thus their behavioral intention to attend MOOCs will increase.

Another contribution is extending the items in the Facilitating Conditions by adding two sets of questions related to Continuous Availability and Time Flexibility in an attempt to have a deeper and a better understanding of the factors within the facilitating conditions that attract users to attend

MOOCs. The facilitating conditions in the original model measured technicalities such as the user's resources, his/her knowledge of how to use a certain technology, the compatibility of the technology with the user's platform and availability and simplicity of support. Most studies investigated the FC effect of the user's behavior. However, this research extended this variable to try to understand exactly what is it in MOOCs that can help make the users more engaged. The results show that having flexibility in the time of attending the MOOCs, a minimum time constraint, continuous availability and 24/7 accessibility are considered by the respondents very useful. By doing so, the researcher was able to study the effect of FC on the Behavioral intention and not just on the user's behavior.

### **6.2.2 Practical contribution: Implications for e-learning, MOOCs and MOOCs designers and decision makers**

The practical contributions of this research can be divided into the following main categories: practical implications that can be applied to e-learning in general, and ones that can be applied to MOOCs specifically. The theoretical part can help the researcher deduce certain implications in an attempt to bridge the gap between theory and practice, and actually have implications that, if applied, can yield positive effect on technology acceptance, and in our case, on MOOCs adoption.

#### **6.2.2.1 Implications within e-learning**

Although MOOCs is a form of e-learning and shares many of its characteristics; and although some factors can have similar effects on both e-learning and MOOCs, there are still some unique characteristics for each of these two. However, it is possible to shed some light on potential points that can have implications on e-learning specifically, and thus with further studies, researchers can decide whether to rule them out or generalize them and project them in the e-learning domain.

For instance, if people who attend e-learning courses share certain things and have certain characteristics in common, the Social Influence effect on their behavioral intention to use a certain technology becomes more important and plays a more influential role. This is not the case of many of the MOOCs out there. However, this applies to many of the e-learning courses. These are courses that address a group of people who share certain things in common: either they are students in the same educational institutions or co-workers in the same corporation, or people who have the same professions. In Wan et al. (2020)'s study, the learners were a group of students who worked

as a team; whereas teachers in Tsenga et al. (2019)'s study were working individually so this might have affected their Behavioral Intention to use MOOCs.

The two new moderators that were studied in this research might also have an effect when it comes to all sort of e-learning courses, so studying them in the context of different e-learning is worth noting. Thus, this research might serve as a contribution to researchers and practitioners involved in development and running e-learning whether in corporate or institutional initiatives.

#### **6.2.2.2 Implications for MOOCs**

As it is already known, UTAUT and most technology acceptance models are designed and used in an attempt to help us understand why technology is adopted. These models are based on theories that try to explain why people use technology in a certain context.

As mentioned previously, MOOCs share many characteristics with e-learning and have differences at the same time. One main difference can be the reason behind enrollment. There are two scenarios. First, MOOCs users are a group of people who attend the same university, or work in the same company or even share the same profession. The second scenario is with MOOCs users being just a group of individuals who neither share the same professions nor work in the same workplace nor attend the same university, so they have nothing in common nor do they know each other or have a chance to actually meet. They are people from around the world with no interaction whatsoever. Therefore, the social influence that is being tested is different in each of these two scenarios. This explains the very weak effect of Social Influence on the Behavioral Intention to use MOOCs that this research reports (2.3% of the BI is explained by SI). The respondents in this research are users whose reason to attend MOOCs is rather personal and almost not affected by people around them. This relationship is neither affected nor moderated by the Group Work Effectiveness, but it is affected by social perceptiveness. The higher the level of social perceptiveness, the more effect Social Influence seem to have on the Behavioral Intention to use MOOCs. This result pushes the research towards a nascent future direction, namely, testing the moderating effect of social perceptiveness on SI/BI relationship exclusively among respondents of MOOCs or e-learning, who either study in the same academic institution or work in the same corporation.

This research shows that 20% of the variance in Behavioral intention to use MOOCs is predicted from Performance Expectancy. This may be explained by the fact that the users of MOOCs place higher importance on usefulness, utility and the learning they will get from these courses. No one is obliging them to enroll. However, in the cases where MOOCs are mandatory and forced upon users by their corporation or university, then it would be a good idea for administrations to stress upon this point and show the users, whether students or professionals, that attending MOOCs can be advantageous to them and performance enhancer.

It also appears that 36.8 % of the variance in Behavioral intention to use MOOCs is predicted from Effort Expectancy. The users in this research opted to enroll and attend these MOOCs. So assumingly, they have a certain level of technological literacy and are aware that there won't be much effort exerted to attend. However, when MOOCs are mandatory and since Effort Expectancy is that much influential, then maybe the decision makers and the implementer of such courses can stress on this point especially since in the cases of mandatory MOOCs, the stress is on the learning and development effect that these courses can grant.

The Facilitating Conditions effect appears to be 15.6% when tested with the original set of questions and increases to 35.4% when additional statement are included and that cover Time Flexibility and Continuous availability. This shows the importance of these two constructs among the tested variables. To increase the behavioral intention of users to attend MOOCs, the decision makers and the implementers can emphasize on these two characteristics to show the users that although MOOCs are mandatory, they are also available 24/7 and they can access them during their free time or any time they want. Unlike other courses, they have the flexibility to choose the time that suits them since the course is continuously available.

The multiple linear regression studied the model as a whole and studied the effect of the variables in a way that shows that among these four variables, Effort Expectancy and Facilitating Conditions that stress on Continuous availability and Time flexibility are basically the most influential and have the changing effect needed.

The results of the two moderators and their effects on the relationships between the dependent variables and the independent variable are also important and can be used to build upon them for future studies and research.

The above allows decision makers and the people who will be implementing MOOCs to understand the factors that can motivate users to register, attend and finish a MOOC course.

According to this research, social perceptiveness as being one component of emotional intelligence plays a role and has a moderating effect especially on social influence relationship with the behavioral intention of users to attend MOOCs. In addition to this, Group Work Effectiveness also has an effect. This means that although these users have registered according to their free will, and that although they do not work in the same corporation or attend the same university, making them work together can be beneficial and can increase the rate of completion in these courses since statistics show that the drop-out rate in these courses is high. This will be further detailed in the recommendation for designers in the next part.

### **6.2.2.3 Implications for MOOCs designers and decision makers**

Taking certain things into consideration while designing a MOOC can be an important step in the missing link and can help increase the rate of completion in these courses.

Results of this research showed that Group Work Effectiveness has an effect on Effort Expectancy and its relationship with the Behavioral Intention to use MOOCs. This can be helpful knowledge for the designers of MOOCs so that they can take that into consideration when preparing teaching materials to be used in the courses. The designers can then move from focusing on the users as individuals and start looking at the potential of making them work in teams, or at least give them the option of working in teams. There could be integration of platforms where users can interact and form groups for team work, as well as using social media platforms to attract those users into working in groups.

The results from testing the second moderator effect, the effect of Social Perceptiveness, can assist those designers have a new option on how to group these individuals: grouping them according to their level of social perceptiveness. The results show that the higher the degree of social perceptiveness, the more their intention of attending and finishing the course would be. So this is one way based on which grouping can be formed. Further studies are needed in this area to prove if this theory is supported when applied in practice and what other factor(s) of classification could be added.

These findings highlight to MOOC and online course developers about factors and variables that can help users better engage in learning and developing their skills in digital environments. They also emphasize the importance of awareness about how the design of digital environments can affect users' engagement in learning, and this can help decrease the rate of dropping out and not finishing these courses. Moreover, since most of designers and implementers of MOOCs are large institutions or universities, they can use their social media platforms to try to attract the right audience and push them to enroll in a MOOC. In doing so, they should keep in mind that attracting those users is not enough, they should work to find ways to retain them and help them throughout the duration of their registration and make sure they finish the course(s). Here comes the role of applying the results of this research and other research and take them into consideration.

### **6.3 Research Limitations**

Researching MOOCs and investigating the factors that can affect the adoption of this e-learning technology was not easy and the research faced several obstacles.

The first obstacle was obviously time and the time constraints that come with a research that is being conducted not just for the sake of academic knowledge but also in fulfilment of the requirements for the degree of Doctor of Philosophy. So basically time, in addition to the lack of financial support, were two major obstacles.

Another obstacle was the spread of a worldwide pandemic. A large part of the research and the data collection phases took place during the 2020 COVID19 pandemic spread. The researcher's only option was to administer the collection of questionnaires and even the Social Perceptiveness test online. It was not easy to have responses from people who seemed to be caught up in so many economic, medical and social problems that made them not have enough time or not interested enough to respond and actually fill the whole questionnaire as well as sit for the test that investigated their social perceptiveness.

The researcher tried to have diversified audience and respondents and has succeeded to a certain extent in doing so since the respondents were from many countries all around the world. The researcher resorted to posting the questionnaires on social media platforms and used ads to boost their reach, yet a good proportion of responses came mainly from Europe more than America or

other continents, more specifically, the majority of responses came from Greece, then Cyprus and Italy.

Another limitation could be the length of the questionnaire and the language used. The researcher tried to make it as summarized as possible, but since there were many variables to be tested, there is a chance that some respondents might have found it long, and this can be also an explanation of why it was difficult to get a large number of responses. As for the language, the test and the questionnaire that were administered were in English. Although the researcher resorted to adding definitions and easier synonyms to the photos that test the social perceptiveness through Reading the Mind in the Eyes test, there is always a chance that some of the respondents might have had problems with the language or the difficulty of the statements or might have misunderstood a certain definition....etc especially that, and as mentioned earlier, the majority of the respondents are from Europe and might not be very fluent in English. Some questions might have created some ambiguity for them while responding to the survey. Despite the several measures taken to decrease this risk, as mentioned in the methodology part, such as adjusting question wording, providing a list of definitions and writing the synonyms of certain words, the risk of some questions not being fully understood remains.

Another possible limitation is that the respondents are people who chose to enroll in MOOCs. The courses are not mandatory. The results might be different if the respondents were forced to take this course or if they were doing this as a requirement in fulfillment of a degree in an educational institution or as a form of development required by their corporation.

A further limitation is the conceptual model itself. The model is based on the UTAUT model and derived from the literature review that the researcher conducted with the aim of studying the factors that affect e-learning in general, and MOOCs in specific. Some variables were added into the model as moderating variables and their effects were tested in addition to extending one of the independent variables. Thus, it can be debated whether or not other variables can be included as well.

A final limitation is the scope of the research. Investigating this conceptual model in some countries does not mean the researcher can easily generalize the results to the rest of the countries or to the whole world. The research is thus limited in space and time.

## 6.4 Future Research Directions

This research can be a part of a series of researches that target e-learning in general and MOOCs in specific and can be considered as a first step in the 100 mile run since there are still so many variables to investigate. Moreover, the study's results need to be supported, confirmed and validated.

The second step after this research would be to conduct more studies and researches to test whether or not they would support the findings of this research and whether or not the effect of the two moderating variables Social Perceptiveness and Group Work Effectiveness remain the same with the passing of time and with another group of respondents.

The researcher would definitely try to have a larger number of respondents from different continents to try to generalize the findings.

Another point would be to have the same research with a different audience, an audience for whom MOOCs is mandatory, more specifically employees who are required to attend a MOOC because their corporation demanded that. From this research, it can be deduced that the higher the level of social perceptiveness is, the more effect Social Influence seems to have on the Behavioral Intention to use MOOCs. This result pushes the research towards a future research direction which is testing the moderating effect of social perceptiveness on SI/BI relationship exclusively among respondents of MOOCs or e-learning, but this time among respondents who share either an academic institution or a corporation.

The results of the research can also direct towards future research. For instance, based on the results of this research, Group Work Effectiveness is found to have a moderating effect on the relationship of Performance Expectancy and the behavioral intention to attend MOOCs.

However, it is worth noting that most of the respondents attending MOOCs in general, and in the case of this research in particular, are professionals who are doing so for professional individual enhancement. They are from different countries located in different regions and not a group of professionals from the same company or organization. The researcher explained this result with the fact that Performance defined as the belief that the use of a particular technology will be advantageous or performance enhancing to the individual, is perceived as individual by nature,

and that most learners will look at it from a personal point of view and thus, what others in the team think will have no or very little effect on their perception. However, when these learners are somehow linked, either through an organization where they work, a school or university they attend, the result of investigating the effect of Group work Effectiveness on the relationship between Performance Expectancy and the learners' intention to attend MOOCs might be different. This is something worth looking into in future researches.

Another finding that can be helpful in future research directions is the finding that Group work effectiveness does not have an effect on the relationship between Social Influence and BI. This finding needs further studying to investigate whether or not the result will change for learners who share a common goal or whose output will be evaluated collectively, rather than individually. This future direction for research will stem from investigating the effect of a concept known as Social Loafing, or the tendency of individuals to put forth less effort when they are part of a group. Findings show that social loafing is more likely to occur when individuals perceive that their outputs cannot be evaluated collectively and would rather be evaluated individually (Latane, et al, 1976). And since the respondents in this research are learners that come from different background and know that their evaluation will rather be individual and not collective, it would be interesting to see if a different result would be reached with respondents who would share an organization, like co-workers or classmates. Maybe in such a case, Group work Effectiveness will have an effect on the relationship between Social Influence and the behavioral intention to attend MOOCs.

Based on the results of this research, Group Work Effectiveness and thus Collective Intelligence have a moderating effect on some of the variables in the UTAUT model, so a next research would tackle this in more details where the researcher can resort to dividing the respondents into two groups: a control and an experimental group. The control group will take e-learning courses or MOOCs separately as individuals, whereas the experimental group will take the e-learning courses or MOOCs in small groups, and both groups will be examined in terms of content and in terms of how they assess the learning process. And the researcher will use the data gathered to study the relationship among different variables.

As the researcher administers the tests online, another thing would be to try in future researches to fine tune them. For instance, find ways to time the responses and make sure the test is done within a certain specific time or if possible, at the same time for all respondents and not at the

convenience of each respondent who might be dividing it on different settings. In the Reading the Mind in the eyes test, nothing specifies that there should be a time constraint. However, this point can be taken into consideration for future researches.

## **6.5 Conclusion**

Chapter 6 is a concluding chapter to the research with implications, contributions along with research limitations.

The chapter started with a summary of the findings and then discussed both contributions of this research: the theoretical and practical contributions.

The research limitations are also discussed before the researcher concludes with the future research directions.



## References

- Adams, G. & Schvaneveldt, J., 1991. *Understanding Research Methods*. 2nd ed. White Plains, NY: Longman.
- Aggarwal, I., Woolley, A., Chabris, C. & Malone, T., 2015. Cognitive Diversity, Collective Intelligence and Learning in Teams. *Current Directions in Psychological Science*, 24(6), pp. 420-424.
- Aggarwal, R. & Prasad, J., 1998. The Antecedents and Consequents of User Perceptions in Information Technology Adoption. *Decision Support Systems*, pp. 15-29.
- Aggarwal, R. & Prasad, J., 1999. Are individual differences germane to the acceptance of new information technologies?. *Decision Sciences* , 30(2), pp. 361-91.
- Ahmed, M., Sangi, N. & Mahmood, A., 2017. A Learner Model for Adaptable e-Learning. *International Journal of Advanced Computer Science and Applications*, pp. 139-147.
- Ajzen, I., 1985. From Intentions to Actions: A Theory of Planned Behavior. In: J. Kuhl & J. Beckmann, eds. *Action Control: From Cognition to Behavior*. Berlin: SSSP Springer Series in Social Psychology, pp. 11-39.
- Ajzen, I., 1985. From Intentions to Actions: A Theory of Planned Behavior. In: J. Kuhl & J. Beckmann, eds. *Action Control Part of the SSSP Springer Series in Social Psychology* . Berlin, Heidelberg.: Springer.
- Ajzen, I., 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes* , 50(2), pp. 179-211.
- Ajzen, I., 1991. The Theory of Planned Behavior. *Behavior and Human Decision Processes*, 50(2), pp. 179-211.
- Ajzen, I. & Albarracin, D., 2007. Predicting and Changing behavior: A Reasoned Action Approach. In: *Prediction and Change of Health Behavior: Applying the Reasoned Action Approach*. Mahwah, NJ : Lawrence Erlbaum Associates Publishers, pp. 3-21.

- Ajzen, I. & Madden, T., 1986. Prediction of goal-direction behavior: Attitudes, intentions and perceived behavioral control. *Journal of Experimental Social Psychology*, 22(5), pp. 453-474.
- Alatabi, M., 2014. Teaching entrepreneurship using massive open online course (MOOC). *Technovation*, 34(4), pp. 261-264.
- Alexander, S. & McKenzie, J., 1998. *An Evaluation of Information Technology Projects in University Learning*. Canberra: Australian Government Publishing Services.
- Al-Gahtani, S., Hubona, G. & Wang, J., 2007. Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT. *Information & Management*, 44(4), pp. 681-691.
- Alhabshi, A., 2002. *E-learning – a Malaysia case study*”,. Kuala Lumpur, Malaysia, National Institute of Public Administration (INTAN).
- Altbach, P., 2014. MOOCs as Neocolonialism: Who controls Knowledge?. *International Higher Education*, 75(Spring), pp. 5-7.
- Analytis, A., Stojic, H., Gelastopoulos, A. & Moussaïd, M., 2017. *Diversity of Preferences Can Increase Collective Welfare in Sequential Exploration Problems*. s.l., Collected Intelligence (CI) Conference, pp. 1-4.
- Anand Shankar Raja, M. & Kallarakal, T., 2020. COVID-19 and Students Perception about MOOCs: a Case of Indian Higher Educational Institutions. *Interactive Technology and Smart Education*, Ahead of Print(Ahead of Print).
- Anon., 2020. *Transaction Process System (TPS)*. [Online]  
Available at: <https://www.techopedia.com/definition/707/transaction-process-system-tps>
- Apperly, I., 2012. What is “theory of mind”? Concepts, cognitive processes and individual differences. *Quarterly Journal of Experimental Psychology*, 65(5), pp. 825-839.
- Argote, L., 2011. Organizational Learning Research: Past, Present and Future. *Management Learning*, 42(4), pp. 439-446..
- Asamoah, M. & Oheneba-Sakyi, Y., 2017. Constructivist Tenets Applied in ICT Mediated Teaching and Learning: Higher Education Perspectives. *Africa education Review* , pp. 196-211.

- Babiker, M. et al., 2014. Health care professional development: Working as a team to improve patient care. *SUDANESE JOURNAL OF PEDIATRICS*, pp. 9-16.
- Bailey, P., 1996. Assuring Quality in Narrative Analysis. *Western Journal of Nursing Research*, 18(2), pp. 186-194.
- Baker, P., 2016. Making Paradigms Meaningful in Mixed Methods Research. *Journal of Mixed Methods Research*, p. 319–334.
- Bandura, A., 1986. *Social Foundations of Thought and Action: A Social Cognitive Theory*. s.l.:s.n.
- Bandura, A., 1997. Self-Efficacy: Toward a Unifying Theory of Behavioral Change. *Psychological Review*, 82(2), pp. 191-215.
- Baron-Cohen, S., 1997. *Mindblindness: An Essay on Autism and Theory of Mind*. London: MIT Press.
- Baron-Cohen, S., Jolliffe, T., Mortimore, C. & Robertson, M., 1997. Read the mind of the Eye. *Journal of Child Psychology and Psychiatry*, Volume 38, pp. 813-822.
- Baron-Cohen, S., Wheelwright, S. & Spong, A., 2001. Are intuitive physics and intuitive psychology independent? A test with children with Asperger Syndrome. *Journal of Developmental and Learning Disorders*, Volume 5, pp. 47-78.
- Blaikie, N., 1993. *Approaches to social Enquiry*. Cambridge: Polity Press.
- Blocker, M., 2005. *E-learning an Organizational necessity, White paper*. [Online] Available at: [www.rxfrohumanperformance.com](http://www.rxfrohumanperformance.com)
- Block, J., 1995. A Contrarian View of the Five-factor Approach to Personality Description. *Psychological Bulletin*, 117(2), pp.187-215., 117(2), pp. 187-215.
- Bonk, C. & Cunningham, D., 1998. *Searching for Learner-centered, Constructivist, and Socio-Cultural Components of Collaborative Educational Learning Tools*. New Jersey: Lawrence Erlbaum Associated.
- Brandon, D. & Hollingshead, A., 2004. Transactive Memory Systems in Organizations: Matching Tasks, Expertise and People. *Organization Science* , 15(6), pp. 633-644..

Brody, N., 2013. *Intelligence*. San Diego: Academic Press.

Brown, I. & Inouye, D., 1978. Learned Helplessness through Modeling: The Role of Perceived Similarity in Competence. *Journal of Personality and Social Psychology*, Volume 36, pp. 900-908.

Brown, L., Murphy, E. & Wade, V., 2006. Corporate e-Learning: human Resource Development Implications for Large and Small Organizations. *Human Resource Development International*, pp. 415-427.

Brown, L., Murphy, E. & Wade, V., 2006. Corporate e-Learning: human Resource Development Implications for Large and Small Organizations. *Human Resource Development International*, pp. 415-427.

Brown, M. et al., 2010. The impact of shift patterns on junior doctors' perceptions of fatigue, training, work/life balance and the role of social support. *Quality and Safety in Health Care*, pp. 1-6.

Brown, S. & Venkatesh, V., 2005. A Model of Adoption of Technology in the Household: A Baseline Model Test and Extension Incorporating Household Life Cycle. *MIS Quarterly*, 29(3), pp. 399-436.

But, V. et al., 2020. Medical Education –From Traditional Learning Methods to E-Learning Methods. *Applied Medical Informatics Point of view* Vol.42, No. 1 /2020, pp: 1-81[, 42(1), pp. 1-8.

Byrne, D., 1971. *The Attraction Paradigm*. s.l.:Academic Press.

Cadorin, L. et al., 2012. Self-directed learning competence assessment within different healthcare professionals and amongst students in Italy. *Nurse Education in Practice*, pp. 153-158.

Campell, M. & Goodstein, R., 2001. The Modernating Effect of Perceived Risk on Consumers' Evaluations of Product Incongruity: Preferences to the Norm. *Journal of Consumer Research*, pp. 439-449.

Cate, O. & Scheele, F., 2007. Competency-Based Postgraduate Training: Can We Bridge the Gap between Theory and Clinical Practice?. *Academic Medicine*, 82(6), pp. 542-547.

Chang, A., 2012. UTAUT AND UTAUT 2: A Review and Agenda for Future Research. *The winners*, pp. 106-114.

Chattopadhyay, S., 2014. *11 Differences between a MOOC and an Online Course*. [Online] Available at: <http://idreflections.blogspot.com/2014/06/11-differences-between-mooc-and-online.html>

[Accessed 2 February 2021].

Cheese, P., 2003. Lost in Translation: Helping Learning Professionals to Speak the Language of Business. *E-learning*, 4(1), pp. 16-18.

Cherry, K., 2019. *How General Intelligence Influences Performance on Cognitive Tasks*. [Online]

Available at: <https://www.verywellmind.com/what-is-general-intelligence-2795210>

Cheung, R. & Vogel, D., 2013. Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning. *Computers and Education*, Volume 63, pp. 160-175.

Chong, A., 2013. A two-staged SEM-neural network approach for understanding and predicting the determinants of m-commerce adoption. *Expert Systems with Applications*, 40(4), pp. 1240-1247.

Coghlan, D. & Brannick, T., 2014. *Doing Action Research in Your Own organization*. London: Sage.

Compeau, D. & Higgins, 1995. Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*, Volume 19, pp. 189-221.

Compeau, D., Higgins, C. & Huff, S., 1999. Compeau, Deborah; Higgins, Christopher; a Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study. *MIS Quarterly*, 23(2), pp. 145-158.

- Conrad, D., 2002. Engagement, Excitement, Anxiety, and Fear: Learners' Experiences of Starting an Online Course. *American Journal of Distance Education*, 16(4), pp. 205-226.
- Conradt, L., List, C. & Roper, T., 2013. Swarm Intelligence: When Uncertainty Meets Conflict. *The American Naturalist*, 182(5), pp. 592-610..
- Cook, D., Dupras, D., Thompson, W. & Pankratz, V., 2005. Web-Based Learning in Residents' Continuity Clinics: A Randomized, Controlled Trial. *Academic Medicine*, 80(1), pp. 90-97.
- Creswell, J. & Plano Clark, V., 2007. *Designing and Conducting Mixed Methods Research*. London: Sage Publications Ltd.
- Crinella, M. & Yu, J., 1999. Brain Mechanisms and Intelligence. Psychometric g and Executive Function. *Intelligence*, 27(4), pp. 299-327.
- Curran, J. & Blackburn, R., 2001. *Researching the Small Enterprise*. London: Sage.
- Davenport, T. & Kirby, J., 2015. *Beyond Automation: Strategies for Remaining Gainfully Employed in an Era of Very Smart Machines*. [Online] Available at: <https://hbr.org/2015/06/beyond-automation> [Accessed 1 February 2021].
- Davis, F., 1989. Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. *MIS Quarterly*, pp. 319-340.
- Davis, F., 1989. Perceived Usefulness, Perceived Ease of Use, and user acceptance of Information Technologies. *MIS Quarterly*, pp. 319-340.
- Davis, F., Bagozzi, R. & Warshaw, R., 1992. Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Social Studies*, 22(14), pp. 1111-1132.
- De Dreu, C. & Weingart, L., 2003. Task versus relationship conflict, team performance, and team member satisfaction: A meta-analysis. *Journal of Applied Psychology*, 88(4), p. 741-749.
- Deary, I., 2000. *Intelligence: A Very Short Introduction*. Oxford, England: Oxford University Press.
- Deary, I., 2013. The Stability of Intelligence From Childhood to Old Age. *Association of Psychological Science*, 23(4), pp. 239-245.

- Decman, M., 2015. Modeling the acceptance of e-learning in mandatory environments of higher education: The influence of previous education and gender. *Computer Human Behavior*, Volume 49, p. 272–281.
- Deng, S., Liu, Y. & Qi, Y., 2011. An Empirical Study on Determinants of Web Based Question-answer Services Adoption. *Online Information Review*, 35(5), pp. 789-798..
- DeSilets, L., 2010. The Institute of Medicine's Redesigning Continuing Education in the Health Professions. *The Journal of Continuing Education in Nursing*, pp. 340-341.
- DeWaard, I., 2013. *MOOC Yourself*. s.l.:e-book.
- Dewey, J., 1938. *Experience and Education*. New York: Macmillan Company.
- Dixon, D., 2007. *Collective Intelligence Is Key to Delivery of Care*. [Online] Available at: [https://www.caringfortheages.com/article/S1526-4114\(07\)60138-3/fulltext](https://www.caringfortheages.com/article/S1526-4114(07)60138-3/fulltext)
- Duffy, T., Dueber, B. & Hawley, C., 1998. Critical Thinking in a Distributed Environment : A pedagogical Base for the Design of Conferencing Systems. In: *Electronic Collaborators: Learner-centered Technologies for Literacy, Apprenticeship, and Discourse*. New Jersey: Routledge, pp. 51-78.
- Dulle, F., 2015. The suitability of the Unified Theory of Acceptance and Use of Technology (UTAUT) model in. *Sage Journal*, Volume 27, pp. 32-45.
- Dutton, J. & Perry, J., 2002. How do online students differ from lecture students?. *Journal of Asynchronous Learning Networks*, pp. 9-30.
- EconomyWatch, 2010. *Health Care Industry*. [Online] Available at: <https://www.economywatch.com/world-industries/health-care/>
- Edmondson, A., 1999. Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly*, 44(2), pp. 350-383.
- Ekblaw, R., 2016. Effective Use Of Group Projects In Online Learning. *Contemporary Issues in Education Research* , 9(3), pp. 121-128.
- Elliott, S., Kratochwill, T. & Littlefield Cook, J., 2000. *Educational psychology: Effective teaching, effective learning*. Boston: McGraw-Hill College.

- Ellis, C., 2002. *Action Research Exchange*, 1(2), pp. 1-7.
- Engel, D. et al., 2015. *Collective Intelligence in Computer-Mediated Collaboration Emerges in Different Contexts and Cultures*. Seoul Republic of Korea, Association for Computing Machinery New York NY United States, p. 3769–3778.
- Engel, D., Woolley, J. L., Chabris, C. & Malone, T., 2014. Engel D, Woolley AW, Jing LX, Chabris CF, Malone TW (2014) Reading the Mind in the Eyes or Reading between the Lines? Theory of Mind Predicts Collective Intelligence Equally Well Online and Face-To-Face. *PLOS One*, 9(12), pp. 1-16.
- Fallahnejad, T. & Mollahoseiny, F., 2016. Relationship between Job Satisfaction and Marital Satisfaction among Nurses with Rotating Working Shift. *International Journal of Pharmaceutical Research & Allied Sciences*, pp. 187-193.
- Farcas, D. & Reininger, M., 2010. DISTANCE EDUCATION IN THE FORM OF E-LEARNING IN CHILE: TRAINING HUMAN CAPITAL FOR THE 21ST CENTURY. *International Journal of Advanced Corporate Learning*, pp. 14-18.
- Fasanelli, R. et al., 2017. Humanisation of care pathways: training program evaluation among healthcare professionals. *Electronic Journal of Applied Statistical Analysis*, pp. 484-497 .
- Fishbein, M., 1967. A behavior Theory Approach to the Relations between Beliefs about an Object and the Attitude toward the Object. In: M. Fishbein, ed. *Readings in Attitude Theory and Measurement* . New York: John Wiley & Sons, pp. 389-400.
- Fishbein, M. & Ajzen, I., 1975. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Fishbein, M. & Ajzen, I., 1975. *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley..
- Fogarty, G., 2008. Intelligence: Theories and Issues. *Adult Educational Psychology*, p. 181–208 .
- Frith, K., 2002. *Effect of conversation on nursing student outcomes in a Web-based course on cardiac rhythm interpretation*, Georgia: Doctoral Dissertation University of Atlanta.

- Gabi, W. et al., 2016. *Validation of Non-formal MOOC-based Learning: An Analysis of Assessment and Recognition Practices in Europe*. [Online]  
Available at: <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/validation-non-formal-mooc-based-learning-analysis-assessment-and-recognition-practices>  
[Accessed 2 February 2021].
- Gamage, D., Fernando, S. & Perera, I., 2015. *Quality of MOOCs: a Review of Literature on Effectiveness and Quality Aspects*. s.l., 8th International Conference on Ubi-Media Computing UMEDIA 2015.
- Glenn, J., 2013. Collective Intelligence and an Application by The Millennium Project. *World Future Review*, p. 235–243.
- Goleman, 1995. *Emotional Intelligence: Why It Can Matter More Than IQ?*. London: Bloomsbury Publishing.
- Goleman, D., 1995. *Emotional intelligence*. New York: Bantam Books.
- Gonzalez, C., 2004. *The Role of Blended Learning in the World of Technology*. [Online]  
Available at: <http://www.unt.edu/benchmarks/archives/2004/september04/eis.html>
- Gottfredson, L., 1997. Why g Matters: The Complexity of Everyday Life. *ScienceDirect*, 24(1), pp. 79-132.
- Gray, J., 1981. *The Transaction Concept: Virtues and Limitations*. CA, Tandem Computers Incorporated., pp. 1-25.
- Greene, J., 2007. *Mixed Methods in Social Inquiry*. San Francisco: Jossey-Bass.
- Grollman, W. & Cannon, C., 2003. E-Learning A Better Chalkboard. *Financial Executive*, pp. p45-47.
- Gruenfeld, D. M. E. W. K. & Neale, M., 1996. Group Composition and Decision Making: How Member Familiarity and Information Distribution Affect Process and Performance. *Organizational Behavior and Human Decision Processes*, 67(1), pp. 1-15.

- Gulati, A. (., 2013. An Overview of Massive Open Online Courses (MOOCs): Some reflections. *International Journal of Digital Library Services*, 33(44), pp. 37-46.
- Gunawardena, C. & Zittle, F., 1997. Social Presence as Predictor of Satisfaction within a Computer-mediated conferencing Environment. *American Journal of Distance Education*, 11(3), pp. 8-26.
- Gupta, B., Dasgupta, S. & Gupta, A., 2008. Adoption of ICT in a government organization in a developing country: An empirical study. *Journal of Strategic Information Systems*, Volume 17, pp. 140-154.
- Hackman, J. & Morris, C., 1975. Group Tasks, Group Interaction Process, and Group Performance Effectiveness: A Review and Proposed Integration. *Advances in Experimental Social Psychology*, Volume 8, pp. 45-99.
- Hallin, K., Haggstrom, M., Backstrom, B. & Kristiansen, L., 2015. Correlations Between Clinical Judgement and Learning Style Preferences of Nursing Students in the Simulation Room. *Global Journal of Health Science*, 8(6), pp. 1-13.
- Hall, J., 1978. Gender Effects in Decoding Nonverbal Cues. *Psychological Bulletin*, 85(4), pp. 845-857.
- Halpern, D., 1992. *Sex Differences in Cognitive Abilities*. 2nd ed. s.l.:Lawrence Erlbaum Associates, Inc..
- Hamilton, B., Nickerson, j. & Owan, H., 2003. Team Incentives and Worker Heterogeneity: An Empirical Analysis of the Impact of Teams on Productivity and Participation. *Journal of Political Economy*, 111(3), pp. 465-497.
- Hansen, Z., Owan, H. & Pan, J., 2006. *The Impact of Group Diversity on Performance and Knowledge Spillover -- An Experiment in a College Classroom*. [Online]  
Available at: <https://www.nber.org/papers/w12251>  
[Accessed 3 July 2020].
- Harb, N. & El Shaarawi, A., 2006. Factors Affecting Students' Performance. *Journal of Business Education*, pp. 282-290.

- Harrison, D. & Klein, K., 2007. What's the Difference? Diversity Constructs as Separation, Variety, or Disparity in Organizations. *The Academy of Management Review*, 32(4), pp. 1199-1228.
- Hejase, H., Al-Sayed, S., Haddad, Z. & Hamdar, B., 2021. Applying Emotional Intelligence in Lebanon: An Exploratory Study. *Universal Journal of Management and Social Sciences*, 2(6), pp. 13-35.
- Heyes, C., 2014. Submentalizing: I Am Not Really Reading Your Mind. *Perspectives on Psychological Science*, 9(2), pp. 131-143.
- Hinsz, V., Tindale, S. & Vollrath, D., 1997. The Emerging Conceptualization of Groups as Information Processes. *Psychological Bulletin*, 121(1), pp. 43-64.
- Hofmann, D., 2002. Internet-based Distance Learning in Higher Education. *Tech Directions*, 62(1), pp. 28-32.
- Hollingshead, A., 2001. Cognitive Interdependence and Convergent Expectations in Transactive Memory. *Journal of Personality and Social Psychology*, 81(6), pp. 1080-1089.
- Horton, R., Buck, T., Waterson, P. & Clegg, C., 2001. Explaining intranet use with the technology acceptance model. *Journal of Information Technology*, 16(4), pp. 237-249.
- Horwitz, K. & Horwitz, I., 2007. The Effects of Team Diversity on Team Outcomes: A Meta-Analytic Review of Team Demography. *Journal of Management*, 33(6), pp. 987-1015.
- Hoy, M., 2014. HMOOCs 101: An Introduction to Massive Open Online Courses. *Medical Reference Services Quarterly*, Volume 33, pp. 85-91.
- Igbaria, M., Gamers, T. & Davis, G., 1995. Testing the Determinants of Micro-computer Usage Via a Structural Equation Model. *Journal of Management Information Systems*, 11(4), pp. 87-114.
- Ilggen, D., Hollenbeck, J., Johnson, M. & Jundt, D., 2005. Teams in Organizations: From Input-Process-Output Models to IMO Models. *Annual Review of Psychology*, Volume 56, pp. 517-543.

Im, I., Hong, S. & Kang, M., 2011. An international comparison of technology adoption: Testing the UTAUT model. *Information & Management*, 48(1), pp. 1-8.

Impey, C., 2020. *Massive Online Open Courses See Exponential Growth during COVID-19 Pandemic*. [Online]

Available at: <https://theconversation.com/massive-online-open-courses-see-exponential-growth-during-covid-19-pandemic-141859>

[Accessed 21 7 2021].

Ireland, T., 2007. *Situating Connectivism*. [Online]

Available at: [http://design.test.olt.ubc.ca/Situating\\_Connectivism](http://design.test.olt.ubc.ca/Situating_Connectivism)

[Accessed 2021].

Jehn, K., Northcraft, G. & Neale, M., 1999. Why Differences Make a Difference: A Field Study of Diversity, Conflict and Performance in Workgroups. *Administrative Science Quarterly*, 44(4), pp. 741-763.

Jehn, K., Northcraft, J. & Neale, M., 1999. Why Differences Make a Difference: A Field Study of Diversity, Conflict and Performance in Workgroups. *Administrative Science Quarterly*, 44(4), pp. 741-763.

Jena, L. & Pradhan, R., 2014. Developing Effective Human Resources for Achieving Business Excellence: Role of Emotional Intelligence. *Training & Development Journal*, 5(2), pp. 140-148.

Jenkins, M. & Hanson, J., 2003. E-learning series: A guide for Senior Managers. *Learning and Teaching Support*.

Johnson, P. & Duberley, J., 2000. *Understanding Management Research: An Introduction to Epistemology*. London: Sage.

Keong, M., Ramayah, T., Kurnia, S. & Chiun, L., 2012. Explaining Intention to Use an Enterprise Resource Planning (ERP) System: an Extension of the UTAUT Model. *Business Strategy Series*, 13(4), pp. 173-180.

Khan, B., 2005. *Managing e-learning strategies: Design, delivery, implementation and evaluation*. Hershey, PA: Information Science Publishing.

- Kim, K., Liu, S. & Bonk, C., 2005. Online MBA students' perceptions of online learning: Benefits, challenges, and suggestions. *The Internet and Higher Education*, 8(4), pp. 335-344.
- Kimura, D., 1992. Sex Differences in the Brain. *Scientific American*, 267(3), pp. 118-125.
- Knippenberg, V. & Shippers, M., 2007. Work Group Diversity. *Annual Review of Psychology*, Volume 58, pp. 515-541.
- Kolmar, C., 2021. *Zippia*. [Online]  
Available at: <https://www.zippia.com/advice/perceptiveness-skills/>  
[Accessed 13 July 2021].
- Kozhevnikov, M., Evans, C. & Kosslyn, S., 2014. Cognitive Style as Environmentally Sensitive Individual Differences in Cognition: A Modern Synthesis and Applications in Education, Business, and Management. *Psychological Science in the Public Interest*, 15(1), pp. 3-33.
- Krause, S. et al., 2011. Swarm Intelligence in Humans: Diversity can Trump Ability. *Animal Behaviours*, 81(5), pp. 941-948.
- Kush, J., 2019. Conceptual and Measurement Issues for Transactive Memory Systems: The Indicators of TMS. *American Psychological Association*, pp. 104-123.
- Larson, J., 2010. *In Search of Synergy in Small Group Performance*. New York: Psychology Press.
- Lee, Y., 2006. An empirical investigation into factors influencing the adoption of an e-learning system. *Online Information Review*, 30(5), pp. 517-541..
- Levine, J. & Moreland, R., 1999. Collaboration: The Social Context of Theory Development. *Personality and Social Psychology Preview*, 8(2), pp. 164-172.
- Lewis, K., 2003. Measuring Transactive Memory Systems in the Field: Scale Development and Validation. *Journal of Applied Psychology*, 88(4), pp. 587-604.
- Lewis, K., 2004. Transactive Memory Systems: Current Issues and Future Research Directions. *Organization Science*, 22(5), pp. 1254-1265.
- Lewis, K. & Herndon, B., 2011. Transactive Memory Systems: Current Issues and Future Research Directions. *Organization Science*, 22(5), pp. 1254-1265.

- Liang, H., Xue, Y., Ke, W. & Wei, K., 2010. Understanding the Influence of Team Climate on IT Use. *Journal of the Association for Information Systems*, 11(8), pp. 414-432..
- Liker, A. & Bokony, V., 2009. Larger Groups are more Successful in Innovative Problem Solving in House Sparrows. *PNAS*, 106(19), p. 7893–7898.
- Limayem, M., Hirt, S. & Cheung, C., 2007. How Habit Limits the Predictive Power of Intention: The Case of Information Systems Continuance. *MIS Quarterly* , 31(4), pp. 705-737.
- Lim, C., 2000. Computer Self-efficacy, Academic Self-concept and Other Factors as Predictors of Satisfaction and Future Participation of Adult Learners in Web-based Distance Education. *American Journal of Distance Education* , 15(2), pp. 41-51.
- Littlepage, G., Hollingshead, A., Drake, L. & Littlepage, A., 2008. Transactive memory and performance in work groups: Specificity, communication, ability differences, and work allocation. *Group Dynamics: Theory, Research, and Practice*, 12(3). *Group Dynamics: Theory, Research, and Practice*, 12(3), pp. 223-241.
- Liu, M., Zha, S. & He, W., 2019. Digital Transformation Challenges: a Case Study Regarding the MOOC Development and Operations at Higher Education Institutions in China. *TechTrends*, Volume 63, pp. 621-630.
- Lokuge, S., Sedera, D. & Nanayakkara, S., 2018. *Innovate or Copy: A Qualitative Document Analysis to Entrepreneurship in Developing Countries*. UK, European Conference on Information Systems (ECIS 2018).
- Loshin, P., 2001. *Transaction Processing*. [Online]  
Available at: <https://www.computerworld.com/article/2584337/transaction-processing.html>
- Lu, C., Chen, S., Huang, P. & Chien, J., 2015. Effect of Diversity on Human Resource Management and Organizational Performance. *Journal of Business Research*, 68(4), pp. 857-861.
- Majumdar, A., 2017. *Top Factors That Affect eLearning Success*. [Online]  
Available at: <https://elearningindustry.com/3-top-factors-affect-elearning-success>

Makary, M. & Daniel, M., 2016. *Medical error—the third leading cause of death in the US*. [Online]

Available at: <https://www.bmj.com/content/353/bmj.i2139.full>

Maldonado, U., Khan, G., Moon, J. & Rho, J., 2011. E-learning Motivation and Educational Portal Acceptance in Developing Countries. *Online Information Review*, 35(1), pp. 66-85.

Mannix, E. & Neale, M., 2005. What Differences Make a Difference?: The Promise and Reality of Diverse Teams in Organizations. *Psychological Science in the Public Interest*, 6(2), pp. 31-55.

Markovic, S. & Jovanovic, N., 2012. Learning style as a factor which affects the quality of e - learning. *Artificial Intelligence Review*, pp. 303- 312.

Marks, L., Hunter, D. & Richard, A., 2011. *Strengthening Public Health Capacity and Services in Europe*, Copenhagen: World Health Organization .

Martin, B. & Healy, J., 2006. Changing Work Organisation and Skill. *Australian bulletin of labour*, pp. 393-435.

Martins, L. et al., 2012. A Contingency View of the Effects of Cognitive Diversity on Team Performance: The Moderating Roles of Team Psychological Safety and Relationship Conflict. *Small Group Research*, 44(2), pp. 96-126.

Mayer, J. & Salovey, P., 1997. What is emotional intelligence? . In: P. Salovey & D. Sluyter, eds. *Emotional Development and Emotional Intelligence: Implications for Educators*. New York: Basic Books, pp. 3-31.

Mayer, R., 2003. Elements of a Science of E-Learning. *Journal of Educational Computing Research*, p. 297–313.

Mayo, A. & Woolley, A., 2016. Teamwork in Health Care: Maximizing Collective Intelligence via Inclusive Collaboration and Open Communication. *AMA Journal of Ethics*, pp. 933-940.

May, T., 2011. *Social Research: Issues, Methods and Research*. London: McGraw-Hill International.

McAuley, A., Stewart, B., Siemens, G. & Cormier, D., 2010. *MOOC Model for Digital Practice*. Charlottetown: University of Prince Edward.

- McGrath, J., 1984. *Groups: Interaction and Performance*. Englewood Cliffs N.J.: Prentice-Hall.
- McLeod, S., 2019. *Constructivism as a theory for teaching and learning*. [Online] Available at: <https://www.simplypsychology.org/constructivism.html>
- McNelis, J., 2014. An Exploratory Study into Virtual Learning Environments as a Training Platform in the Workplace. *International Journal of Advanced Corporate Learning*, pp. 8-11.
- Means, B. et al., 2009. *Evaluation of Evidence-based Practices in Online Learning: a Meta-analysis and Review of Online Learning Studies*, Washington, DC: US Department of Education.
- Medin, D., Bennis, W. & Chandler, M., 2010. Culture and the Home-Field Disadvantage. *Perspective on Psychological Science*, 5(6), pp. 708-713.
- Meisinger, K. & Wohler, D., 2016. Walking the Walk in Team-Based Education: The Crimson Care Collaborative Clinic in Family Medicine. *AMA Journal of Ethics*, pp. 910-916 .
- Mello, A. & Ruckes, M., 2006. Team Composition. *The Journal of Business*, 79(3), pp. 1019-1040.
- Michaelsen, L., Watson, W. & Black, R., 1989. A realistic test of individual versus group consensus decision making. *Journal of Applied Psychology*. *Journal of Applied Psychology*, 74(5), pp. 834-839.
- Milliken, F. & Martins, 1996. Searching for Common Threads: Understanding the Multiple Effects of Diversity in in Organizational Groups. *The Academy of Management Review*, 21(2), pp. 402-433.
- Mirani, R. & King, W., 1994. Impacts of End-user and Information Center Characteristics on End-user Computing Support. *Journal of Management Information Systems*, 11(1), pp. 141-166.
- Mirvis, P., Sales, A. & Hackett, E., 1991. The Implementation and Adoption of New Technology in Organizations: The Impact on work, People and Culture. *Human Resource Management*, pp. 113-139.
- Montano, D. & Kasprzyk, D., 2008. The Theory of Reasoned Action and the Theory of Planned Behavior. In: K. Glanz, B. Rimer & K. Viswanath, eds. *Health Behavior and Health Education*. San Francisco, CA: Jossey-Bass Publishers. , pp. 67-96.

- Moore, G. & Benbasat, I., 1991. Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), pp. 173-191.
- Moreland, R., 1999. Transactive memory: Learning who knows what in work groups and organizations. In: L. Thompson, D. Messivk & J. Levine, eds. *LEA's organization and management series. Shared cognition in organizations: The management of knowledge* . Mahwah, NY: Lawrence Erlbaum Associates Publishers, pp. 3-31.
- Mount, M., Barrick, m. & Stewart, G., 1998. Five-Factor Model of Personality and Performance in Jobs Involving Interpersonal Interactions. *Human Performance*, 11(2), pp. 145-165.
- Mount, M., Barrick, M. & Stewart, G., 1998. Personality Predictors of Performance in Jobs Involving Interaction with Others. *Human Performance*, 11, 145–166., Volume 11, p. 145–166..
- Murray, P. & Blackman, D., 2006. *New Dimensions in Team Learning: A Social Constructionist Approach*. s.l., University of Warwick.
- Murray, S., 2019. *Moocs Struggle to Lift Rock-bottom Completion Rates*. [Online] Available at: <https://www.ft.com/content/60e90be2-1a77-11e9-b191-175523b59d1d> [Accessed 21 7 2021].
- Nayda, N. & Rankin, E., 2008. Information literacy skill development and life long learning: exploring nursing students' and academics' understandings. *Australian Journal of Advanced Nursing*, p. 27–33.
- Nemeth, C., 1986. The Differential Contributions of Majority and Minority Influence. *Psychological Review* , 93(1), pp. 23-32.
- Nisha, F. & Senthil, V., 2015. MOOCs: Changing Trend Towards Open Distance Learning with Special Reference to India. *Journal of Library and Information Technology*, 35(2), pp. 82-89.
- Nye, J., Orel, E. & Kochergina, E., 2013. Big Five Personality Traits and Academic Performance in Russian Universities. *WP BRP Series: Science, Psychology*, pp. 1-13.
- Nye, J., Orel, E. & Kochergina, E., 2013. Big Five Personality Traits and Academic Performance in Russian Universities. *SSRN Electronic Journal*.

- O'cass, A. & Fenech, T., 2003. Web Retailing Adoption: Exploring the Nature of Internet Users Web Retailing Behavior. *Journal of Retailing and Consumer Services*, 10(1), pp. 81-94.
- Onah, D., Sinclair, J. & Boyatt, R., 2014. Dropout Rates of Massive Open Online Courses: Behavioural Patterns. *EDULEARN'14* , p. 5825–5834.
- Ornos, P. S. e. a., 2011. *Facilitators of the Learning Process*. Manila: Grandwater Publications..
- Overbay, A., Patterson, A., Vasu, E. & Grable, L., 2010. Amy Overbay, Ashley S. Patterson, Ellen S. Vasu & Constructivism and Technology Use: Findings from the IMPACTing Leadership Project. *Educational Media International*, pp. 103-120.
- Ozer, D. & Benet-Martinez, V., 2006. Personality and the Prediction of Consequential Outcomes. *Annual Review of Psychology*, Volume 57, pp. 401-421 .
- Ozer, D. & Benet-Martínez, V., 2006. Personality and the Prediction of Consequential Outcomes. *Annual Review of Psychology*, 57(1), pp. 401-421.
- Palloff, R. & Pratt, K., 1999. *Building Learning Communities in Cyberspace: Effective Strategies for the Online Classroom*.. San Francisco, CA.: Jossey-Bass Publishers.
- Pelled, L., 1996. Relational Demography and Perceptions of Group Conflict and Performance: A Field Investigation. *International Journal of Conflict Management*, 7(3), pp. 230-246.
- Pentland, A., 2008. *Honest Signals: How they Shape Our World*. s.l.:MIT Press.
- Petaloti, S., 2017. Lifelong Learning in Nursing Science and Practice: A Bibliographic Review. *Hellenic Journal of Nursing Science*, pp. 45-48.
- Piaget, J., 1971. *The theory of stages in cognitive development*. Citation. New York: McGraw-Hill.
- Pokhrel, S. & Chhetri, R., 2021. Literature Review on Impact of Covid 19 Pandemic on Teaching and Learning. *Higher Education for the Future* , 8(1), p. 133–141.
- Porter, M. & Lee, T., 2013. *The Strategy That Will Fix Health Care*. [Online] Available at: <https://hbr.org/2013/10/the-strategy-that-will-fix-health-care>

- Premack, D., 1978. Does the chimpanzee have a theory of mind?. *The Behavioral and Brain Sciences*, Volume 1, pp. 515-526.
- Puri, G., 2012. Critical success Factors in e-Learning -An Empirical Study. *International Journal of Multidisciplinary Research*, 2(1), pp. 149-161.
- Pynoo, B. et al., 2011. Predicting secondary school teachers' acceptance and use of a digital learning environment: A cross-sectional study. *computers in human Behavior*, Volume 27, pp. 568-575.
- Qalehsari, M., Khaghanizadeh, M. & Ebadi, A., 2017. Lifelong learning strategies in nursing: A systematic review. *Electronic Physician*, p. 5541–5550.
- Qalehsari, M., Khaghanizadeh, M. & Ebadi, A., 2017. Lifelong learning strategies in nursing: A systematic review. *Electron Physician*, p. 5541–5550.
- Raboca, H. & Carbuorean , F., 2014. ICT IN EDUCATION - EXPLORATORY ANALYSIS OF STUDENTS' PERCEPTIONS REGARDING ICT IMPACT IN THE EDUCATIONAL PROCESS. *Managerial Challenges of the Contemporary Society*, pp. 59-66.
- Ralph, W., 1991. *The Art of Computer Technical Support*. California: Peachipt Press.
- Ramayah, T., Honh, T. & Ahmad, N., 2011. An Assessment of E-training Effectiveness in Multinational Companies in Malaysia. *Educational Technology & Society*, pp. 125-137.
- Reed, M., 2005. Reflections on the 'Realist Turn' in Organization and Management Studies. *Journal of Management Studies*, pp. 1621-1644.
- Remenyi, D., Williams, B., Money, A. & Swartz, E., 1998. *Doing Research in Business and Management*. Thousand Oaks, CA: Sage Publications.
- Richard, O., 2000. Racial Diversity, Business Strategy, and Firm Performance: A Resource-Based View. *The Academy of Management Journal* , 43(2), pp. 164-177.
- Richards, D. & Pryce, J., 2006. EI: Well-being and performance. *Competency emotional intelligence*, Volume 13, pp. 41-45.
- Robson, C., 2002. *Real World Research : A Resource for Social Scientists and Practitioner-Researchers*. Oxford : Oxford Blackwell Publishers.

- Rollins, A., 2018. *elearningindustry.com*. [Online]  
Available at: <https://elearningindustry.com/whats-a-mooc-history-principles-characteristics>  
[Accessed 2 February 2021].
- Ruiz, J., Mintzer, M. & Leipzig, R., 2006. The Impact of E-Learning in Medical Education. *Academic Medicine*, pp. 207-212.
- Salovey, P. & Mayer, J., 1990. Emotional Intelligence. *Imagination, Cognition, and Personality*, Volume 9, pp. 185-211.
- Sambrook, S., 2004. ELearning in Small Organizations. In: *HRP in Small Organisations: Research and Practice*. London: Routledge, pp. 185-214.
- Santos, 2012. Knowledge Management and Strategic Orientation: Leveraging Innovativeness and Performance. *Journal of Knowledge Management*, 16(5), pp. 688-701.
- Saunders, M., Lewis, P. & Thornhill, A., 2016. *Research Methods for Business Students*. London: Pearson.
- Schepers, J. & Wetzels, M., 2007. A Meta-analysis of the Technology Acceptance Model: Investigating Subjective Norm and Moderation Effects. *Information & Management*, 44(1), pp. 90-103.
- Schetler, J., 2003. Cisco's Kelly: It's more than Training. *Training*, 40(1), p. 16.
- Schneider, B., Goldstein, H. & Smith, D., 1995. The ASA framework: An update. *Personnel Psychology*, 48(4), p. 747-773.
- Serrat, O., 2010. E-learning and the workplace. *Asian Development Bank*.
- Shah, D., 2018. *By the Numbers: MOOCS in 2018*. [Online]  
Available at: <https://www.classcentral.com/report/>  
[Accessed 22 7 2021].
- Shani, A. & Sean, J., 1994. Information Technology and the Integration of Change: Socio-technical System Approach. *Journal of Applied Behavioral Science*, pp. 247-270.

Sheppard, B., Hartwick, J. & Warshaw, J., 1988. The Theory Of Reasoned Action: A Meta-Analysis Of Past Research With Recommendations For Modifications And Future Research. *Journal of Consumer Research*, 15(3), pp. 325-343.

Shukla, A. & Srivastava, R., 2016. Meta analysis of the relationship between Emotional Intelligence and different behavioural intentions. *Research Journal of Business Management*, 10(4), pp. 58-73.

Shulman, L. & Shulman, J., 2004. How and What Teachers Learn: A Shifting Perspective. *Journal of Curriculum Studies*, 36(2), pp. 257-271.

Siemens, G., 2004. *Connectivism: A Learning Theory for the Digital Age*. [Online] Available at: <http://www.elearnspace.org/Articles/connectivism.htm>

Slavin, R., Hurley, E. & Chamberlain, A., 2003. Cooperative Learning and Achievement: Theory and research. *Handbook of Psychology: Educational Psychology*, Volume 7, p. 177–198.

Sood, Y., 2016. *Why businesses should invest more in employee training to enhance profit margins*. [Online] Available at: [https://yourstory.com/2016/05/employee-training-investment?utm\\_pageloadtype=scroll](https://yourstory.com/2016/05/employee-training-investment?utm_pageloadtype=scroll)

Soomro, S., 2010. *E-learning Experiences and the Future*. Croatia: InTech.

Soong, M., Chan, H., Chua, B. & Loh, K., 2001. Critical Success Factors for Online Course Resources. *Computers and Education*, 36(2), pp. 101-120.

Spearman, C., 1904. General intelligence: objectively determined and measured. *The American Journal of Psychology*, pp. 201-293.

Statistics, L., 2018. *Laerd Statistics*. [Online] Available at: <https://statistics.laerd.com/statistical-guides/pearson-correlation-coefficient-statistical-guide.php>

[Accessed March 2021].

Sternberg, R., 2001. Measuring the idea of an idea: How intelligent is the idea of emotional intelligence?. In: J. Ciarrochi, J. Forgas & J. Mayer, eds. *Emotional Intelligence in Everyday Life*. Philadelphia: Psychol. Press, pp. 187-194.

Stokes, J., 1983. Predicting Satisfaction with Social Support from Social Network Structure. *American Journal of Community Psychology*, 11(2), pp. 115-220.

Strother, J., 2002. An Assessment of the Effectiveness of e-learning in Corporate Training Programs. *The International Review Of Research In Open And Distributed Learning*.

Surjono, H., 2011. The Design of Adaptive e-learning System Based on Student's Learning Styles. *International Journal of Computer Science IT*, pp. 2350-2353.

Taifel, H., 1981. *Human Groups and Social Categories: Studies in Social Psychology*. London: Cambridge University Press.

Tan, P., 2013. Applying the UTAUT to Understand Factors Affecting the Use of English E-Learning Websites in Taiwan. *Sage open*, Volume 3, pp. 1-12.

Tashakkori, A. & Teddlie, 2010. *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. 2nd ed. Thousand Oaks, California: SAGE Publications, Inc.

Tashakkori, A. & Teddlie, C., 2010. *Handbook of Mixed Methods in Social and Behavioral Research*. Thousand Oaks, CA: SAGE.

Taylor, S. & Todd, P., 1995. Assessing IT usage: The Role of Prior Experience. *MIS Quarterly*, pp. 561-570.

Taylor, S. & Todd, P., 1995. Understanding Information Technology Usage: A Test of Competing Models. *Information Systems Research*, 6(2), pp. 85-188.

Teddlie, C. & Tashakkori, A., 2010. *Foundations of Mixed Methods Research*. Los angeles: SAGE.

Thompson, R., Higgins, C. & Howell, J., 1991. Personal Computing: Toward a Conceptual Model of Utilization. *MIS Quarterly*, 15(1), p. 124-143.

- Thong, Hong, S. & Tam, K., 2006. The Effects of Post-adoption Beliefs on the Expectation-confirmation Model for Information Technology Continuance. *International Journal of Human-Computer Studies*, 64(9), pp. 799-810.
- Tindale, R. & Larson, J., 1989. Assembly bonus effect or typical group performance? A comment on Michaelsen, Watson, and Black. *Journal of Applied Psychology*, 77(1), pp. 102-105.
- Tomte, C., 2019. MOOCs in teacher education: institutional and pedagogical change?. *EUROPEAN JOURNAL OF TEACHER EDUCATION*, 42(1), pp. 65-81.
- Tornatsky, L. & Klein, K., 1982. Innovation Characteristics and Innovation-Adoption-Implementation: A Meta-analysis of findings. *IEEE Transactions on Engineering Management*, 29(1), pp. 28-43.
- Triandis, H., Kurowski, L. & Gelfand, M., 1994. Workplace Diversity. In: C. Triandis, M. Dunnette & L. Hough, eds. *Handbook of Industrial and Organizational Psychology*. s.l.:Consulting Psychologists Press, pp. 769-827.
- Tsenga, T., Linb, S., Wang, Y. & Liuc, H., 2019. Investigating teachers' adoption of MOOCs: the perspective of UTAUT2. *Interactive Learning Environments*, pp. 1-16.
- Tsui, A., Egan, T. & O'Reilly, C., 1992. Being Different: Relational Demography and Organizational Attachment. *Administrative Science Quarterly*, 37(4), pp. 549-579.
- Urdan, T. & Weggen, C., 2000. *Corporate E-Learning: Exploring a New Frontier*, s.l.: WR Hambrecht + Co..
- Vaill, P., 1996. *Learning as a Way of Being*. San Francisco, CA: Jossey-Blass Inc..
- Venkatesh, V. & David, F., 2000. A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), pp. 186-204.
- Venkatesh, V., Morris, M., Davis, G. & Davis, F., 2003. User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), pp. 425-478.
- Venkatesh, V. & Zhang, X., 2010. Unified theory of acceptance and use of technology: US vs. China.. *Journal of Global Information Technology Management*, 13(1), pp. 5-27.

- Vlasceanu, L., Grunberg, L. & Parela, D., 2004. *Quality Assurance and Accreditation: A Glossary of Basic Terms and Definitions*, Bucharest: UNESCO.
- Vygotsky, L., 1978. *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wadhvani, P. & Gankar, S., 2019. *Global Market Insights*. [Online]  
Available at: <https://www.gminsights.com/industry-analysis/elearning-market-size>
- Wang, Y., Wu, M. & Wang, H., 2009. Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology*, 40(1), pp. 92-118.
- Wan, L., Xie, S. & Shu, A., 2020. Toward an Understanding of University Students' Continued Intention to Use MOOCs: When UTAUT Model Meets TFF Model. *Sage*, Volume 3, pp. 1-15.
- Watmough, S., O'Sullivan, H. & Taylor, D., 2009. Graduates from a traditional medical curriculum evaluate the effectiveness of their medical curriculum through interviews. *BMC Med Educ*. 2009;9:64., 9(64), pp. 1-7.
- Web, 2019. *Cambridge Dictionary's Word of the Year 2019*. [Online]  
Available at: <https://dictionaryblog.cambridge.org/2019/11/04/cambridge-dictionary-word-of-the-year-2019/>
- Weeger, S. & Farin, E., 2016. The effect of the patient–physician relationship on health-related quality of life after cardiac rehabilitation. *Disability and Rehabilitation* , 39(5), pp. 468-476.
- Wegner, D., 1987. Transactive Memory: A Contemporary Analysis of the Group Mind. In: B. Mullen & G. Goethals, eds. *Theories of Group Behavior*. New York: Springer Series in Social Psychology, pp. 185-208.
- Wegner, D., Erber, R. & Raymond, P., 1991. Transactive Memory in Close Relationships. *Journal of Personality and Social Psychology*, 61(6), pp. 923-929.
- Wegner, D., Giuliano, T. & Hertel, P., 1985. Cognitive Interdependence in Close Relationships.. In: J. Ickes, ed. *Compatible and Incompatible Relationships*. New York: Springer-Verlag, pp. 253-276.

- Westra, E. & Carruthers, P., 2018. Theory of Mind. In: T. Shackelford & A. Weekes-Shackelford, eds. *Encyclopedia of Evolutionary Psychological Science*. Cham: Springer, pp. 92-98.
- Williams, K. & O'Reilly, C., 1998. Demography and Diversity in Organizations: A Review of 40 Years of Research. *Research in Organizational Behavior*, Volume 20, pp. 77-140.
- Williams, P., 2002. The Learning Web: the Development, Implementation, and Evaluation of Internet-based Undergraduate Materials for the Teaching of Key Skills. *Active Learning in Higher Education*, 3(1), pp. 40-53.
- Witelson, S., 1976. Sex and the Single Hemisphere: Specialization of the Right Hemisphere for Spatial Processing. *Science*, 193(4251), p. 425-427. .
- Woodley, A. & Bell, E., 2011. Is Collective Intelligence (Mostly) the General Factor of Personality? A Comment on Woolley, Chabris, Pentland, Hashmi and Malone (2010). *Intelligence*, 39(2), pp. 79-81.
- Wooley, A., Aggarwal, W. & Malone, T., 2015. Collective Intelligence and Group Performance. *Current Directions in Psychological Science*, pp. 420-424.
- Woolley, A. et al., 2010. Evidence of a Collective Intelligence Factor in the Performance of Human Groups. *Science*, pp. 686-688.
- Wu, B. & Chen, X., 2017. Continuance Intention to Use MOOCs: Integrating the Technology Acceptance Model (TAM) and Task Technology Fit (TTF) Model. *Computers in Human Behavior*, Volume 67, pp. 221-232.
- Wu, I., Li, J. & Fu, C., 2011. The Adoption of Mobile Healthcare by Hospital's Professionals: An Integrative Perspective. *Decis Support Syst*, 51(3), pp. 587-596.
- Xiong, J., Qureshi, S. & Najjar, L., 2013. *Factors that affect information and communication technology adoption by small businesses in China*. Chicago, 19th Americas Conference on Information Systems, AMCIS.
- Xiong, Q., 2018. College English MOOC Teaching on SWOT Analysis. *Educational Sciences: Theory and Practice*, 18(6), pp. 3529-3535.

- Yao, Y., Han, X., Liu, Y. & Cheng, J., 2013. A Comparative Study of MOOCs and Distance Education on the Operating Mechanism. *Journal of Distance Education*, 31(6), p. 3–10.
- Yoo, J., Han, H. & Huang, H., 2012. The roles of intrinsic motivators and extrinsic motivators in promoting e-Learning in the workplace: A case from South Korea. *Computers in Human Behavior*, 28(3), pp. 942-950.
- Yousafzai, S., Foxall, G. & Pallister, J., 2010. Explaining Internet Banking Behavior: TRA, TPB, or TAM?. *Journal of Applied Social Psychology*, 40(5), pp. 1172-1202.
- Yuan, S., 2020. *AlJazeera*. [Online]  
Available at: <https://www.aljazeera.com/news/2020/03/china-ai-big-data-combat-coronavirus-outbreak-200301063901951.html>
- Yucel, A., 2006. E-Learning Approach in Teacher Training. *Turkish Online Journal of Distance Education*, 7(4), pp. 1302-6488 .
- Yuen, Y., Yeow, P., Lim, N. & Saylani, N., 2010. Internet banking adoption: Comparing developed and developing countries. *Journal of Computer Information Systems*, 51(1), pp. 52-61.
- Zhenghao, C. et al., 2015. *Who's benefiting from MOOCs, and why*. [Online]  
Available at: <https://hbr.org/2015/09/whos-benefiting-from-moocs-and-why>  
[Accessed 24 7 2021].
- Zhou, T., Lu, Y. & Wang, B., 2010. Integrating TTF and UTAUT to explain mobile banking user adoption.. *Computers in Human Behavior*, 26(4), pp. 760-767.

## Appendices

### Appendix I Questionnaire

# Examining Social Perceptiveness and Group Work Effectiveness as Factors for E-learning Adoption in Professional Settings: Case of MOOCs Users

Thank you for the time and effort you may take to fill in this form. This questionnaire is part of an academic research, please note that your answers and any personal information you share are to be held in strict confidentiality and will be used only for the purposes of this academic research. The results will be reported in aggregate form only, and you will never be identified individually. \* Required

1. Electronic consent: If you agree to participate in the research study, please click on the "Agree" button below, and we will continue with the general questions on the next page. If you don't agree, thank you for your consideration. \*

Agree

### Demographic Section

2. Gender \*

Male

Female

3. Age \*

Less than 24

25-34

35-49

50 or more

4. your E-mail address and place of residence \*

\_\_\_\_\_

5. Number of years of experience in your profession \*

- Less than 5 years
- 5 to 10 years
- 11 to 15
- 16 or more

**Reading the Mind in the Eyes RME Test**  
(developed by prof. Simon Baron-Cohen at the University of Cambridge)

For each set of eyes, please choose which word best describes what the person in the picture is thinking or feeling. You may feel that more than one word is applicable but please choose just one word, the word which you consider to be most suitable. Before making your choice, make sure that you have read all 4 words. Though it is not timed, please try to do the task as quickly as possible.

Thank You

PS: You can find the definitions for some of the adjectives that describe the photos.

6. Photo 1

playful  
( Full of high spirits and fun )

comforting  
(consoling, compassionate )

1



irritated  
(annoyed )

bored

- Playful
- Comforting
- Irritated
- Bored



\*

7. Photo 2

**terrified**  
(alarmed, fearful )

**upset**  
(agitated, worried, uneasy )

2



**arrogant**  
(important, having a big opinion of oneself )

**annoyed**  
(irritated, displeased )

- Terrified
- Upset
- Arrogant
- Annoyed

8. Photo 3

\*

joking  
(being funny, playful)

flustered  
(confused, nervous and upset)

3



desire  
(passion, lust, longing for)

convinced  
(certain, absolutely positive)

- Joking
- Flustered
- Desire
- Convinced

9. Photo 4

UNIVERSITY of NICOSIA

\*

joking  
(being funny, playful)

insisting  
(demanding, persisting,  
maintaining)

4



amused  
(finding something funny)

relaxed  
(taking it easy, calm, carefree)

- Joking
- Insisting
- Amused
- Relaxed

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\*

10. Photo 5

irritated  
(annoyed)

sarcastic  
(mocking, cynical, scornful)

5



worried  
(anxious, troubled)

friendly  
(sociable, amiable)

- Irritated
- Sarcastic
- Worried
- Friendly

11. Photo 6

UNIVERSITY of NICOSIA

\*

aghast  
(horrified, astonished, alarmed)

fantasizing

6



impatient  
(restless, wanting something to happen soon)

alarmed  
(fearful, worried, filled with anxiety)

- Aghast
- Fantasizing
- Impatient
- Alarmed

12. Photo 7

\*

apologetic  
(feeling sorry)

friendly  
(sociable, amiable)

7



uneasy  
(unsettled, troubled)

dispirited  
(miserable, low)

- Apologetic
- Friendly
- Uneasy
- Dispirited

13. Photo 8

UNIVERSITY of NICOSIA

\*

despondent  
(gloomy, despairing, without hope)

relieved  
(freed from worry or anxiety)

8



shy

excited

- Despondent
- Relieved
- Shy
- Excited

14. Photo 9

UNIVERSITY of NICOSIA

\*

annoyed  
(irritated, displeased )

hostile  
(unfriendly)

9



horrified  
(terrified, very afraid)

preoccupied  
(distracted, absorbed in one's own thoughts )

- Annoyed
- Hostile
- Horrified
- Preoccupied

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15. Photo 10

cautious  
(careful)

10

insisting  
(demanding, persisting, maintaining)



bored

aghast  
(horrified, astonished, alarmed)

- Cautious
- Insisting
- Bored
- Aghast

16. Photo 11 \*

terrified  
(very afraid)

amused  
(finding something funny )

11



regretful  
(sorry)

flirtatious  
(teasing, playful )

- Terrified
- Amused
- Regretful
- Flirtatious

17. Photo 12

UNIVERSITY of NICOSIA

indifferent  
(doesn't care)

embarrassed  
(ashamed)

12



sceptical  
(doubtful, suspicious, mistrusting)

dispirited  
(miserable, low)

- Indifferent
- Embarrassed
- Sceptical
- Dispirited

UNIVERSITY of NICOSIA

\*

18. Photo 13

decisive  
(already made your mind up)

anticipating  
(expecting)

13



threatening  
(intimidating)

shy

- Decisive
- Anticipating
- threatening Shy
- 19. Photo 14

UNIVERSITY of NICOSIA

\*

irritated  
(annoyed )

14

disappointed  
(displeased )



depressed  
(miserable )

accusing  
(blaming )

- Irritated
- Disappointed
- Depressed
- Accusing

20. Photo 15

UNIVERSITY of NICOSIA

\*

contemplative  
(reflective, thoughtful, considering)

flustered  
(confused, nervous & upset)

15



encouraging  
(hopeful, heartening, supporting)

amused  
(finding something funny)

- Contemplative
- Flustered
- Encouraging
- Amused

21. Photo 16

\*

irritated  
(annoyed )

thoughtful  
(thinking about something )

16



encouraging  
(hopeful, heartening, supporting )

sympathetic  
(kind, compassionate )

- Irritated
- Thoughtful
- Encouraging
- Sympathetic

22. Photo 17

UNIVERSITY of NICOSIA

\*

doubtful  
(suspicious, not really believing )

affectionate  
(showing fondness towards someone )

17



playful  
(full of high spirits and fun )

aghast  
(horrified, astonished, alarmed )

- Doubtful
- Affectionate
- Playful
- Aghast

23. Photo 18

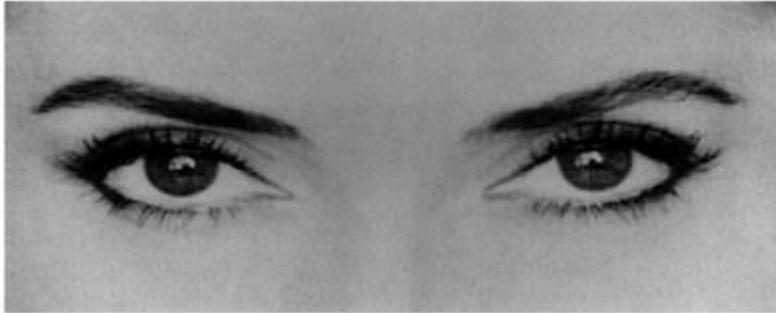
UNIVERSITY of NICOSIA

\*

**decisive**  
(already made your mind up )

**amused**  
(finding something funny )

**18**



**aghast**  
horrified, astonished, alarmed

**bored**

- Decisive
- Amused
- Aghast
- Bored

24. Photo 19

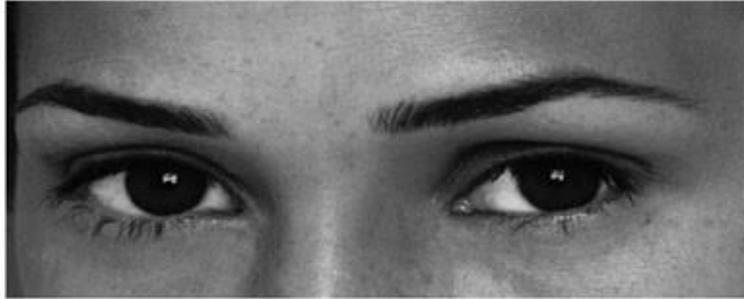
UNIVERSITY of NICOSIA

\*

**arrogant**  
self-important, having a big  
opinion of oneself

**grateful**  
thankful

19



**sarcastic**  
(mocking, scornful)

**tentative**  
hesitant, uncertain, cautious

- Arrogant
- Grateful
- Sarcastic
- Tentative

25. Photo 20

UNIVERSITY of NICOSIA

\*

dominant (commanding, bossy)      friendly (sociable, amiable)

20



guilty (feeling sorry for doing something wrong)      horrified (terrified, afraid)

- Dominant
- Friendly
- Guilty
- Horrified

26. Photo 21

UNIVERSITY of NICOSIA

\*

embarrassed  
(ashamed)

fantasizing  
(daydreaming)

21



confused  
(puzzled, perplexed)

panicked  
(feeling of terror or anxiety)

- Embarrassed
- Fantasizing
- Confused
- Panicked

27. Photo 22

UNIVERSITY of NICOSIA

\*

preoccupied  
(absorbed, engrossed in one's own thoughts )

22

grateful  
(thankful )



insisting  
(demanding, persisting, maintaining )

imploring  
(begging, pleading )

- Preoccupied
- Grateful
- Insisting
- Imploring

28. Photo 23

UNIVERSITY of NIOSIA

\*

contented  
(satisfied)

23

apologetic  
(feeling sorry)



defiant  
(bold, doesn't care what anyone else thinks)

curious  
(inquisitive, inquiring, prying)

- Contened
- Apologetic
- Defiant
- Curious

29. Photo 24

UNIVERSITY of NIGROSIA

\*

**pensive**  
(thinking about something slightly worrying )

**irritated**  
(annoyed )

24



**excited**  
(very enthusiastic)

**hostile**  
(unfriendly)

- Pensive
- Irritated
- Excited
- Hostile

30. Photo 25

UNIVERSITY of NICOSIA

\*

panicked  
(feeling of terror or anxiety)

25

incredulous  
(not believing)



despondent  
(gloomy, despairing, without hope)

interested  
(inquiring, curious)

- Panicked
- Incredulous
- Despondent
- Interested

31. Photo 26

UNIVERSITY of NIOSIA

\*

alarmed  
(fearful, worried, filled with anxiety)

shy

26



hostile  
(unfriendly)

anxious  
(worried, tense, uneasy)

- Alarmed
- Shy
- Hostile
- Anxious

32. Photo 27

UNIVERSITY of NICOSIA

\*

joking  
(being funny, playful)

cautious  
(careful)

27



arrogant  
(self-important,  
having a big opinion of oneself)

reassuring  
(supporting, encouraging, giving  
someone confidence)

- Joking
- Cautious
- Arrogant
- Reassuring

33. Photo 28

UNIVERSITY of NICOSIA

\*

interested  
(inquiring, curious )

joking  
(being funny, playful )

28



affectionate  
(showing fondness towards someone )

contented  
(satisfied )

- Interested
- Joking
- Affectionate
- Contented

34. Photo 29

UNIVERSITY of NICOSIA

\*

impatient  
(restless, wanting something to happen soon )

29

aghast  
(horrified, astonished, alarmed)



irritated  
(annoyed )

reflective  
(contemplative, thoughtful)

- Impatient
- Aghast
- Irritated
- Reflective

35. Photo 30

UNIVERSITY of NICOSIA

\*

grateful  
(thankful)

flirtatious  
(teasing, playful)

30



hostile  
(unfriendly)

disappointed  
(displeased)

- Grateful
- Flirtatious
- Hostile
- Disappointed

36. Photo 31

UNIVERSITY of COSIA

\*

ashamed  
(overcome with shame or guilt)

confident  
(self-assured, believing in oneself)

31



joking  
(being funny, playful)

dispirited  
(miserable, low)

- Ashamed
- Confident
- Joking
- Dispirited

37. Photo 32

UNIVERSITY of COSIA

\*

serious

(grave )

ashamed

(overcome with shame or guilt )

32



bewildered

(utterly confused, puzzled, dazed )

alarmed

(fearful, worried, filled with anxiety )

- Serious
- Ashamed
- Bewildered
- Alarmed

38. Photo 33

UNIVERSITY of NICOSIA

\*

embarrassed  
(ashamed)

guilty  
(feeling sorry for doing  
something wrong)

33



fantasizing  
(daydreaming)

concerned  
(worried, troubled)

- Embarrassed
- Guilty
- Fantasizing
- Concerned

39. Photo 34

UNIVERSITY of NIGOSIA

\*

aghast  
(horrified, astonished, alarmed ) 34

baffled  
(confused, puzzled )



distrustful  
(suspicious, doubtful )

terrified  
(afraid)

- Aghast
- Baffled
- Distrustful
- Terrified

40. Photo 35

UNIVERSITY of NEOSIA

\*

puzzled  
(confused)

nervous  
(apprehensive, tense, worried)

35



insisting  
(demanding, persisting, maintaining)

contemplative  
(reflective, thoughtful)

- Puzzled
- Nervous
- Insisting
- Contemplative

41. Photo 36

UNIVERSITY of Nicosia

\*

**ashamed**  
(overcome with shame or guilt)

**nervous**  
(tense, worried)

36



**suspicious**  
(disbelieving, suspecting, doubting)

**indecisive**  
(unsure, hesitant, unable to make your mind up)

- Ashamed
- Nervous
- Suspicious
- Indecisive

**MOOC  
Adoption**

MOOC stands for Massive Open Online Courses. The below section has general questions about your MOOCs experience.

**Performance  
Expectancy**

PE is a belief that the use of a particular technology will be advantageous or performance enhancing to the individual.

42. Please rate the following statements on a scale from 1 - 7, with 1 being strongly disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree.

\*

Mark only one oval per row.

	1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Nor agree, nor disagree	5 Somewhat agree	6 Agree	7 Strongly agree
PE1: I would find MOOCs useful for my career or job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PE2: Attending MOOCs facilitates the accomplishment of tasks more quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PE3: Attending MOOCs enhances productivity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PE4: I would attend MOOCs again.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PE5: I would find using MOOCs advantageous amid the COVID-19 pandemic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Effort Expectancy  
(EE)

EE is a belief that the use of a particular technology will be easy and effortless.

- 43.

disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree. \*

Mark only one oval per row.

	1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Nor agree, nor disagree	5 Somewhat agree	6 Agree	7 Strongly agree
EE1: I find it easy to attend MOOCs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EE2: The interaction with MOOCs is easy for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EE3: The process of learning through MOOCs is easy for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EE4: I would find MOOCs easy for me to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EE5: It is easy to use MOOCs and stay safe from COVID-19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Social Influence (SI)

SI comprises the ways in which individuals change their behavior to meet the demands of a social environment.

44. Please rate the following statements on a scale from 1 - 7, with 1 being strongly disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree. \*

Mark only one oval per row.

	1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Nor agree, nor disagree	5 Somewhat agree	6 Agree	7 Strongly agree
SI1: The majority of my family use MOOCs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SI2: Colleagues who are important to me believe that I should attend MOOCs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SI3: The majority of my friends attend MOOCs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SI4: People who have an impact on my behavior think that I should attend MOOCs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
SI5: One of my family members/friends/colleagues has recommended that I should attend MOOCs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Facilitating conditions (FC)**

FC is an organizational and technical infrastructure supporting the use of acquired systems in their contexts.

45.

disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree. \*



easy to get.

---

FC6: MOOCS  
availability on  
a 24/7 basis  
is truly  
appreciated.

---

FC7: Time  
Flexibility in  
attending  
MOOCs  
makes it very  
helpful.

---

FC8: The  
minimum  
time  
constraint in  
attending  
MOOCs is  
very helpful.

---

FC9:  
Continuous  
accessibility  
to MOOCs is  
very helpful.

---

FC10: It is  
very helpful  
to access  
MOOCs  
anytime.

Fear of Technological  
Advances (FOTA)

FOTA is the fear or dislike of advanced technology or complex devices, especially computers.

46.

disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree. \*

Mark only one oval per row.

	1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Nor agree, nor disagree	5 Somewhat agree	6 Agree	7 Strongly agree
FOTA1: I am worried about the rapid advances in MOOCs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FOTA2: I am not comfortable with the trends in technological advancement of MOOCs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FOTA3: I am feeling anxious about attending MOOCs since the outbreak of COVID-19.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Perceived  
Privacy,  
Security  
& Trust  
(PPST)**

PPST is the online privacy usually connected with information privacy and therefore is described as Internet users' concerns regarding their ability to control the collection of their personal information, as well as to control the future usage of the collected information or the information that was generated based on their online activities.

47. Please rate the following statements on a scale from 1 - 7, with 1 being strongly disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree.

\*



could lead to  
the exposure  
of my  
personal  
information.

---

PPST7:  
Attending  
MOOCs  
would reduce  
the privacy  
of my  
personal  
information.

**Behavioral Intention  
(BI)**

BI is an individual intention to use a particular technology that directly affects actual usage.

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48. Please rate the following statements on a scale from 1 - 7, with 1 being strongly disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree. \*

Mark only one oval per row.

	1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Nor agree, nor disagree	5 Somewhat agree	6 Agree	7 Strongly agree
BI1: Assuming I have access to MOOCs, I intend to use it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
BI2: Given that I had access to MOOCs I predict that I would use it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
BI3: I plan to attend MOOCs in the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

User Behavior (UB)

UB investigates the adoption of MOOCs by the users.

49. Please rate the following statements on a scale from 1 - 7, with 1 being strongly disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree. \*

Mark only one oval per row.

	1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Nor agree, nor disagree	5 Somewhat agree	6 Agree	7 Strongly agree
UB1: I have attended at least one MOOC within the last 6 months.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
UB2: I haven't attended any MOOCs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
UB3: I attend MOOCs frequently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Social Perceptiveness

50. Please rate the following statements on a scale from 1 - 7, with 1 being strongly disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree. \*



successful for  
me.

---

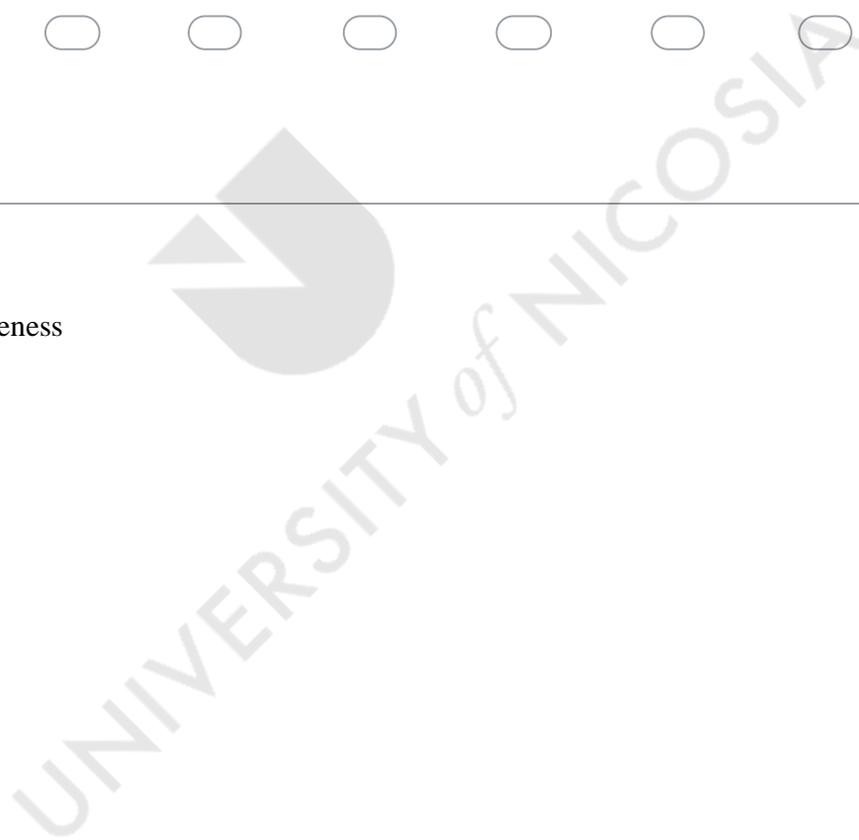
SP5: Because I  
show concern  
for others'  
needs,  
advancing in  
MOOCs was  
not difficult

---

SP6: My ability  
to recognize  
my own  
strengths and  
weaknesses  
made  
advancing in  
MOOCs easier.

---

Group Work Effectiveness



51. Please rate the following statements on a scale from 1 - 7, with 1 being strongly disagree, 2 disagree, 3 somewhat disagree, 4 neither agree nor disagree, 5 somewhat agree, 6 agree and 7 being strongly agree. \*





the  
outcomes.

---

GWE4: I  
would get a  
better  
outcome if  
I work  
alone in  
MOOCs.

GWE5: My  
work in the  
MOOCs  
makes  
dealing  
with  
problems  
easier.

Thank you!

---

  
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## Appendix II Respondents' Gender Distribution

### Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	66	26.1	26.1	26.1
	Male	187	73.9	73.9	100.0
	Total	253	100.0	100.0	

## Appendix III Respondents' Age Distribution

### Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 25	15	5.9	5.9	5.9
	25-34	56	22.1	22.1	28.1
	35-49	117	46.2	46.2	74.3
	50 or more	65	25.7	25.7	100.0
	Total	253	100.0	100.0	

## Appendix IV Respondents' years of experience in their professions

### Number of years of experience in your profession

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5	60	23.7	23.7	23.7
	5 to 10	47	18.6	18.6	42.3
	11 to 15	37	14.6	14.6	56.9

16 or more	109	43.1	43.1	100.0
Total	253	100.0	100.0	

## Appendix V Reliability Statistics

### RME Photos

#### Reliability Statistics

Cronbach's Alpha	N of Items
.717	36

### Performance Expectancy

#### Reliability Statistics

Cronbach's Alpha	N of Items
.861	5

### Effort Expectancy

#### Reliability Statistics

Cronbach's Alpha	N of Items
.919	5

### Social Influence

**Reliability Statistics**

Cronbach's Alpha	N of Items
.869	5

Facilitating conditions

**Reliability Statistics**

Cronbach's Alpha	N of Items
.803	10

FOTA

**Reliability Statistics**

Cronbach's Alpha	N of Items
.834	3

Trust, Perceived privacy & Security

**Reliability Statistics**

Cronbach's Alpha	N of Items
.642	7

Behavioral Intention

**Reliability Statistics**

Cronbach's Alpha	N of Items
.906	3

### User Behavior

#### Reliability Statistics

Cronbach's Alpha	N of Items
.230	3

### Social Perceptiveness

#### Reliability Statistics

Cronbach's Alpha	N of Items
.893	6

### Group Work Effectiveness

#### Reliability Statistics

Cronbach's Alpha	N of Items
.714	5

### Appendix VI Pearson Correlation Coefficients Analysis Results

#### Correlations

	PE	EE	SI	FCOriginal	FC_Final

PE	Pearson Correlation	1	.526**	.201**	.376**	.493**
	Sig. (2-tailed)		.000	.001	.000	.000
	N	253	253	253	253	253
EE	Pearson Correlation	.526**	1	.143*	.463**	.652**
	Sig. (2-tailed)	.000		.023	.000	.000
	N	253	253	253	253	253
SI	Pearson Correlation	.201**	.143*	1	.339**	.116
	Sig. (2-tailed)	.001	.023		.000	.065
	N	253	253	253	253	253
FCOriginal	Pearson Correlation	.376**	.463**	.339**	1	.540**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	253	253	253	253	253
FC_Final	Pearson Correlation	.493**	.652**	.116	.540**	1
	Sig. (2-tailed)	.000	.000	.065	.000	
	N	253	253	253	253	253
FOTA	Pearson Correlation	-.066	-.134*	.261**	.104	-.119
	Sig. (2-tailed)	.299	.033	.000	.099	.058
	N	253	253	253	253	253
PPST	Pearson Correlation	.338**	.191**	.150*	.271**	.266**
	Sig. (2-tailed)	.000	.002	.017	.000	.000
	N	253	253	253	253	253
BI	Pearson Correlation	.448**	.606**	.152*	.395**	.595**
	Sig. (2-tailed)	.000	.000	.016	.000	.000
	N	253	253	253	253	253
UB	Pearson Correlation	.161*	.171**	.419**	.267**	.071
	Sig. (2-tailed)					
	N					

Sig. (2-tailed)	.011	.006	.000	.000	.262
N	253	253	253	253	253

Appendix VII

Appendix VIII

Appendix IX



