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Learner engagement in a MOOC in the Arab world: A case study analysis using the community of inquiry framework

Nadine Aboulmagd

The American University in Cairo

Graduate School of Education (GSE)

Learner Engagement in MOOCs in the Arab World: A Case Study Analysis Using the Community of Inquiry Framework

A Thesis Submitted by

Nadine Khaled Aboulmagd
Submitted to the Department of International & Comparative Education

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In partial fulfillment of the requirements for
The degree of Master of Arts
in Educational Leadership
has been approved by

Thesis Supervisor: Dr. Ted Purinton
Thesis Supervisor Signature Ted Purinton
Affiliation: GSE - AUC
Date

First Reader: Dr. Russanne Hozayin
Thesis first Reader Signature R Hozayin by R. Hozayin
Affiliation: GSE - AUC
Date

Second Reader: Dr. Maha Bali
Thesis Second Reader Signature Maha Aiyham Bali
Affiliation: AUC
Date

Dr. Heba El Deghaidy H El-Deghaidy
Department Chair
Date

Dr. Ted Purinton
Dean of GSE
Date Dec 7 2017

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Cc: Dena Riad & Salma Serry

From: Atta Gebril, Chair of the IRB

Date: Oct. 26, 2017

Re: Approval of study

This is to inform you that I reviewed your research proposal entitled "**Learner Engagement in a MOOC in the Arab World: A Case Study Analysis Using the Community of Inquiry Framework**" and determined that it required consultation with the IRB under the "expedited" heading. The proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants.

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Dr. Atta Gebril
IRB chair, The American University in Cairo
2046 HUSS Building
T: 02-26151919
Email: agebril@aucegypt.edu

American University in Cairo
Graduate School of Education

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As I look back on this chapter in my life, with all its happy, sad, funny, and difficult moments I went through, I am filled with joy, pride and gratitude. Because it is in these moments, that I've had lifetime experiences, lifelong knowledge and endless memories.

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Abstract
Massive Open Online Courses (MOOCs) have been offered by many institutions around the globe for the better part of a decade, and more recently in the Arab World. Learner engagement in MOOCs has also been researched in attempts to explain the varying degrees of engagement in these courses. This research aimed to explore the factors that affect learner engagement using an Arabic MOOC about E-Marketing offered by Edraak, one of the leading MOOC providers in the region, as a case study. This study used a mixed methods approach to explore the significance of the relationship between a) learner engagement and multiple demographic and psychographic variables of learners, and b) learner engagement and the perception of learners about the Community of Inquiry (CoI) presences; teaching presence, social presence and cognitive presence. Additionally, the research included interviews with some of the learners who participated in the MOOC in order to better understand the factors they themselves attribute to their engagement or disengagement; aiming to also explore the relationship between their engagement levels and their motivations, intentions from enrolling in the MOOC and self-regulated learning strategies. This study used a Chi-square test to explore which variables and presences had statistically significant relationships with engagement, which was defined as the level of learner interaction with the course activities, namely watching the weekly videos and attempting to solve the weekly quizzes. The results of the Chi-square test as well as a thematic analysis of the interviews using the CoI model, theories of motivation, self-regulated learning and andragogy are presented. Results of Chi-square test indicated that there is in fact statistical significance between learner engagement and variables such as age group, goal from enrolling in the MOOC, knowledge about the MOOC subject, eligibility for receiving a course completion certificate, previous enrollment in MOOCs and self-motivation. There was no statistical significance observed between the level of learner engagement and their perceptions of the CoI presences. A discussion on the interpretation of this data, the study limitations as well as recommendations for future research is also presented.

Keywords: *MOOCs, engagement, types of MOOCs, motivation, adult learning, self-regulated learning, lifelong learning, community of inquiry, learning analytics.*

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Learner Engagement in a MOOC in the Arab World: A Case Study Analysis Using the Community of Inquiry Framework

CHAPTER I: Introduction and Context

Online learning has not only grown in popularity over the last decade, but it has also spread to various corners of the overall higher education landscape. Thus, researching ways in which to make online courses engaging for students is very important in order to create more successful online learning experiences (Dixon, 2010; Guo, Kim & Rubin, 2014). More specifically, Massive Open Online Courses (MOOCs) have increased exponentially in numbers over this past decade (McMinn, 2013; Shah, 2016c); more specifically, in 2016, 23 million unique MOOC registrations occurred worldwide, making the total number of learners enrolled in at least one MOOC approximately 58 million (Shah, 2016c). In addition to having spread globally, MOOCs have also strongly perforated the Arab World, with various MOOC platforms established and exponential numbers of learners enrolling in MOOC providing platforms (Zafar, 2016; Sallam, 2017; ArabNet, 2013). However, there is a great deal of challenge in engaging students in MOOCs, which is said to be as a result of learners' diverse backgrounds and the large enrollment numbers, to name a few factors (Hew, 2016). O' Shea, Stone and Delahunty (2015) cite several scholars in stating that "effectively engaging students early in their program is a key strategy to reducing student attrition" (p. 42). Moreover, studies conducted in both face-to-face and online learning environments indicate that student engagement is instrumental for successful learning in that it enhances the overall student experience and reduces attrition, therefore it is a main element in effective online teaching (Guo, Kim & Rubin, 2014; Hew, 2016; Walji, Deacon, Small & Czerniewicz, 2016; Dixon, 2010).

It is no surprise that online learning is gaining this momentum; the role of technology in teaching and learning has evolved rapidly, and learners of the 21st century are quickly adopting the new technologies that arise on a daily basis, accordingly spending more time engaging with these technologies and the online environment through social media platforms (Black, 2010). Additionally, higher educational institutions are moving towards online learning, as it is a way to increase

student enrollment and education access at a lower cost (Green, 2010). Economic downturn is actually one of the main reasons why online learning and distance education have been growing rapidly in the past few decades (Allen & Seaman, 2013, Allen & Seaman, 2010; Green, 2010). This demand for online education, stems from economic downturn, has lead to universities offering online courses, since students can save time and money on commuting to campus, and can carry out their work schedules while also completing their education (Green, 2010). It is therefore the responsibility of educators to look deeper into these trends and find ways in which to adapt to students' needs and engaging environments (Lieberman & Pointer-Mace, 2010).

Massive Open Online Courses (MOOCs), in their most basic form, are free online courses that are open to a large or massive number of participants to enrol. A more detailed definition of MOOCs, their structure and types are provided in the 'History of MOOCs' and 'Conceptual Frameworks of MOOCs' sections of this paper. While MOOCs are growing rapidly and spreading widely across the globe, they face high attrition rates, which means students drop out of the course before completion. This is often credited to lack of learner engagement, for which reasons vary greatly among learners. Some of these reasons are the massive enrollment numbers, diversity of learners, lack of human interaction between learners and teachers and among students, free admission and varied intentions or motivations in MOOC enrolment. (Hew, 2016; as cited in O' Shea, Stone & Delahunty, 2015; Jordan 2015b; MOOC Maker, 2016). Understanding the design factors and elements that lead to higher learner engagement in MOOCs is accordingly of imperative benefit to their advancement and development. This research project is a case study that aims to explore the factors that affect learner engagement in an E-Marketing MOOC in the Arab World, using the Community of Inquiry (CoI) model, and theories of motivation and self regulated learning, both as data collection methods, among other methods, as well as a frameworks of analysis; as lenses to explore factors that lead to higher engagement in MOOCs.

Statement of Research Problem and Research Questions

Research Problem

MOOCs have a high learner disengagement rate, which could be caused by

many factors. Learners in MOOCs are different from fully enrolled online or face-to-face students and MOOCs themselves are different in their designs, implementation, assessment, requirements and pedagogies from formal or credit-bearing online or face-to-face courses. There hasn't been much research conducted on the topic of increasing learner engagement in MOOCs in particular, thus it's important to explore factors that would lead to more adequately engaging learners in MOOCs.

Research Questions

RQ 1: What is the nature of the relationship between learner engagement and selected learner variables for the learners who participated in the E-Marketing MOOC?

RQ2: What is the nature of the relationship between low/high engagement and perceptions of weak/strong social presence, teaching presence, and/or cognitive presence by learners who participated in the MOOC?

CHAPTER II: Review of Relevant Literature

This section is a literature review of the topics and areas relevant to this study. The body of research on MOOCs in the Arab world and the Middle East is still in its infancy, therefore this research study contributes to the existing, yet limited, research through the literature review, the data collected and analysis of the results. Moreover, because MOOCs are becoming a trend and are growing rapidly in the Arab world nowadays, a foundation of research on the topic will contribute to its advancement and development in the region, as it will give baseline data to potential researchers, online educators, instructional designers and developers of MOOCs. In addition, this study contributes to the versatile and diverse body of research on the Community of Inquiry (CoI) theoretical framework from a different perspective, as the CoI instrument will be translated and used to collect data on a MOOC in the Arab world.

MOOCs are becoming a trend in international education and are growing rapidly in the Arab world nowadays (Lee et al., 2014). Thus a foundation of research on the topic fosters their advancement and development in the region, as it will offer data to potential researchers and developers of MOOCs.

What are MOOCs?

It is challenging to locate one agreed upon definition of MOOCs as there have been several attempts to coin one definition (European Commission, 2014), which I believe is because there are two main types of MOOCs (cMOOCs and xMOOCs).

These types of MOOCs are based on different theories and have different scopes, as will be shown in the comparison between them in the 'Conceptual and Pedagogical Frameworks of MOOCs' section. However, The European Commission, in an online published report, defines a MOOC generally as "an online course open to anyone without restrictions (free of charge and without a limit to attendance), usually structured around a set of learning goals in an area of study, which often runs over a specific period of time (with a beginning and end date) on an online platform which allows interactive possibilities (between peers or between students and instructors) that facilitate the creation of a learning community. As it is the case for any online course, it provides some course materials and (self) assessment tools for independent studying" (European Commission, 2014). In many cases MOOCs neither require fees nor prerequisites (Baturay, 2015), and are open to anyone regardless of their age or background (Ozturk, 2015). Additionally, participants flexibly engage with the course according to their availability, self-organize, are assessed by their peers if they choose to be and use open educational resources (Ozturk, 2015). With regards to the characteristics of MOOCs and learners who enroll in them, learners usually enroll in MOOCs for the purposes of professional interests, to gain education in a field and/or to receive certificates for their careers, or as a hobby (Baturay, 2015). Further characteristics are: the great majority of learners in MOOCs are adults (above 18 years old), MOOCs average between 5 and 12 weeks in length and English is the main language used (Baturay, 2015).

MOOCs differ greatly from traditional, for credit face-to-face and online courses, which is an important distinction to make before going deeper into the particular characteristics and differences between MOOC types and pedagogies. To do so I created Table 1 below, from my understanding of MOOCs throughout my experience with them, which outlines a comparison between traditional for-credit face-to-face courses, traditional for-credit online courses and MOOCs.

Table 1: Comparison between for-credit traditional face-to-face and online courses, and MOOCs.

Criteria / Type of course	For-credit, traditional, face to face Courses	For-credit, traditional online courses	MOOCs
Participation criteria/enrollment	Closed courses, registration and enrollment required	Closed courses, registration and enrollment required	Open for enrollment without registration
Content types	Mainly lectures, textbooks, articles, multimedia and electronic resources	Online lectures, synchronous meetings, videos, could also include Open Educational Resources (OERs)	Short 5-10 minute videos, online short readings, mostly OERs
Assessment	Instructor/TA assessment	Instructor/TA assessment, could also have small components of peer assessment	Automated assessment (mainly in xMOOCs), Peer Assessment (also common in xMOOCs) and self assessment (common in both types of MOOCs)
Credit	For credit	For credit	Mostly non-credit courses, but some have optional credit that could count towards a degree
Certification	Granted upon degree completion	Granted upon degree completion	Some don't offer certification and some offer certificates of course completion only if learner completes requirements and pays
Tuition/payment	Paid	Paid	Mostly Free Sometimes certificates are free, but mostly learners pay to receive certificate (small fee in comparison to traditional online courses)
Learners/students	Mostly undergraduates and graduates, (some graduates are also working professionals	Could be undergraduates, graduates (most graduates are working professionals)	Mostly working professionals and adult learners, but some are graduates and undergraduates

The following section will outline the history of MOOC development in general, and their development in the Arab world in particular. Following that, the conceptual frameworks and learning theories that underpin the design and development of MOOCs, as well as this research study are presented.

History and Development of MOOCs in the World and the Middle East/Arab World

MOOCs are growing steadily and rapidly but do not have an extensive history. The history of MOOCs does not extend very far back in time; rather they have been a characteristic of 21st century education with the rise of distance education and online learning programs (Baturay, 2015). Specifically, the first incident where the term appeared was in 2008 when Stephen Downes and George Siemens offered a 12-week MOOC, *Connectivism and Connective Knowledge*, based on the 'connectivist' distributed peer-learning model at the University of Manitoba, Canada (Siemens, 2013). The MOOC aimed to explore the concepts of Connectivism and Connective knowledge and their application to theories of teaching and learning (Downes & Siemens, 2011). Following that, the second MOOC was offered in 2011, the year that MOOCs spread around the world, where professors at Stanford University developed many educational videos and published them, along with supported free web resources, via open online platforms (Baturay, 2015). Preceding MOOCs however, Massachusetts Institute of Technology began the MIT OpenCourseWare initiative in 2001, where the institute placed all materials from their undergraduate and graduate courses online openly available to everyone on the web (Goldberg, 2001). This is believed to have set the stage for this idea of offering educational resources openly online for a massive audience. In 2012 Coursera was established as an independent for-profit platform, along with other independent non-profit initiatives such as Udacity and Udemy. In addition, MIT and Harvard combined their MITx platform into EdX (Baturay, 2015). At this point other European platforms started spreading. UK's Open University, a leading institution in the field of distance education that has pedagogical experience from offering distance and open courses since 1971, established Futurelearn in 2013. In addition, the German initiative Iversity was founded and is characterized by using the European Credit Transfer System (Baturay, 2015). In the last few years, MOOC enrollment has increased from thousands to millions around the

globe; in North America, South America, Europe, Asia, Australia, Africa (Balch, 2013; Breslow, Pritchard, DeBoer, Stump, Ho & Seaton, 2013) and the Arab World (ArabNet, 2013).

Shortly after Coursera, edX and Udacity were established in 2013, the Middle East also saw the flourishing of MOOCs in 2014 (Adham & Lundqvist, 2015). Online learning and MOOCs have started gaining popularity and high enrollment in the Middle East over the past few years (Adham & Lundqvist, 2015). In fact, MOOCs have started appearing in the region in 2013 and 2014, and are continuing to expand as a form of educational technology (Adham & Lundqvist, 2015). MOOCs are spreading across the Arab world at a steady and rapid speed and they are no longer only offered in only the English Language. 2013 saw the launch of Rwaaq, which offers educational material openly on various topics in Arabic (Rwaaq, n.d.) and MenaVersity, which offers a variety of courses and resources in Arabic as well, but it is now in its testing phase (MenaVersity, n.d.). In 2014 the Queen Rania Foundation for Education and Development in Jordan partnered with edX and launched Edraak, the first ever Arabic MOOC platform to partner with academic institutions and offers MOOCs in various disciplines in the Arabic language in order to target Arabic-speaking learners in the region (Adham & Lundqvist, 2015). Table 2 below offers an overview of the major MOOC platforms in the world, as well as all the platforms in the Middle East/Arab world, to provide context and a more holistic picture of MOOC platforms globally, with their launch dates, countries of origin, language of instruction, number of MOOCs offered so far, number of enrollments to date, and whether they are still in operation or not.

Table 2: MOOC Platforms in the World and in the Middle East and Arab world

Platform Name	Launch Date	Main Language	Number of MOOCs	Number of Learners	Still in Operation	Country of Origin
Coursera	April 2012	English	1700+	23 million	Yes	USA
Udacity	January 2012	different	170+	4 million	Yes	USA
Udemy	2009	different	15000	14 million	Yes	Turkey
Edx	May 2012	English	1300	10 million	Yes	USA
Futurelearn	September 2013	English (Pilots of non-English language courses are starting)	480	More than 7 million	Yes	UK
Edraak	May 2014	Arabic	36	1 million	Yes	Jordan
Rwaq	September 2013	Arabic	85	600,000	Yes	Saudi Arabia
MenaVersity	2013	Arabic	N/A	N/A	Yes	Lebanon
Skill Academy	2013	English	N/A	N/A	No	Egypt

I developed this table, based on information from a collection of sources (Shah, 2016a; Shah, 2016b; Shah 2016c; Class Central (a); Class Central (b); Rwaaq, n.d.; Edraak, n.d.; MenaVersity, n.d.; Futurelearn, n.d.; Patricia, 2016; Fox, 2017; Udemy, 2017)

The Potential and Limitations of MOOCs

MOOCs have been progressing at a high speed and were seen by some to have the potential to impact teaching approaches in higher education (Adham & Lundqvist, 2015; Yuan & Powell, 2013). At first, the rise of MOOCs gained ample attention from the media, academics, students and policy makers at higher education institutions, and even high school students (Brahimi & Sarirete, 2015; Yuan & Powell, 2013;

Friedman, 2012). Since then there has been an ongoing debate about the role, significance, potential and limitations of MOOCs. On the one hand, at the start when there was a hype around MOOCs, which has decreased now, some educators perceived them as the future of higher education, and that MOOCs could bring transformative change to education as well as the how academic institutions are working (Brahimi & Sarirete, 2015). Also, in 2013 there were claims about the possibilities of MOOCs solving the issue of lack of access to education and higher education in both developed and developing countries because anyone in the world can access them as long as they have internet, computer literacy, and have literacy of the language in which the MOOC is offered (Lane, 2013; Liyanaguanawardena et al., 2013; Yuan & Powell, 2013). They also offer a high value for universities with regards to "education access, experimentation and brand extension" (as cited in Adham & Lundqvist, 2015, p. 129). Developing countries face many challenges in education, such as access to education, language and computer literacy among others (Liyanaguanawardena et al., 2013). Thus MOOCs were framed to have the possibility of solving issues related to the lack of university places (as cited in Adham & Lundqvist, 2015, p. 129) and the lack of access to education that arise in these countries, as they provide extensive learning opportunities to vast numbers of participants anywhere around the world as long as they have internet access (Liyanaguanawardena et al., 2013).

Overall, MOOCs were seen to have the potential to positively influence the traditional higher education system in the Arab world, however it was too early to claim that they can go as far as substituting traditional education (Brahimi & Sarirete, 2015). I don't believe that this claim in particular can be made at this point, since it's not likely. However, recently there has been a direction of MOOCs counting towards part of a postgraduate degree; Edx in partnership with some universities has introduced the MicroMasters program. This allows learners to apply to the university offering credit for these MicroMasters programs, and if they get accepted they could pursue an accelerated and less expensive Master's Degree (EdX, n.d.).

On the other hand, there are educators who consider MOOCs as representing the beginning of education downfall (Brahimi & Sarirete, 2015). Faculty members, according to Brahimi & Sarirete (2015) do not reject technology but rather believe in

its potential to start transformative change in education, but at the same time they believe that the phenomenon of MOOCs is driven by commercial, rather than pedagogical, considerations. MOOCs are also perceived by some to be moving from "freemium" to "premium" where platforms are aiming to create different business models from offering them (Daniel, Cano & Cervera, 2015). One of the common critiques of MOOCs is the extremely low completion rates (Jordan, 2015a; Jordan, 2015b; Khalil & Ebner, 2014; Clow, 2013; Breslow et al., 2013). Additionally, many educators are skeptical of the quality of education provided by MOOCs, and are concerned about the limitation and devaluation of teacher-student interaction in MOOCs (Brahimi & Sarirete, 2015; Yuan & Powell, 2013). Also, some have mentioned the risk that the enthusiasm about MOOCs is mainly "driven by a self selecting group of highly educated, IT literature individuals who are able to navigate the sometimes complex, confusing and intimidating nature of online learning" (Yuan & Powell, 2013, p. 3). Further, there hasn't been much discussion about how MOOCs would increase participation in higher education through widening the participation to members of societies who have not traditionally participated in higher education or increase the completion of higher education qualifications (Lane, 2013). Although many MOOCs are offered by prestigious universities, they would not be able to substitute a world class educational experience (Adham & Lundqvist, 2015). Many of these "elite" universities offering MOOCs currently use them in order to flip some of their classrooms, rather than substitute entire university courses (Brahimi & Sarirete, 2015; Yuan & Powell, 2013).

There are further limitations regarding MOOCs, which raise some concerns on what role MOOCs can or should play and how they fit in the higher education system. The first of these is that the vision that MOOCs remove obstacles to education for everyone is not materializing because most MOOCs that are offered still follow a top-down, controlled, teacher-centered, centralized learning model (Yousef, Chatti, Schroeder & Wosnitza, 2015). There have been a few attempts to create student-centered, open, distributed forms of xMOOCs that are more bottom-up, but these have been the exception to the rule (Yousef et al., 2015); however, almost all cMOOCs are like this. In addition there are pedagogical concerns about MOOCs such as; the absence of serious pedagogy (Vardi, 2012); lack of proper assessment and feedback

(Hill, 2013); lack of sufficient interactivity between the participants and the material and between participants and instructors (Brahimi & Sarirete, 2015;).

There is also a concern, criticized as it may be, that the spread of MOOCs would result in teachers being unimportant or obsolete (Hew, 2016). For example, when Philosophy Professors at San Jose University we asked to use a MOOC developed by Edx and taught by a Harvard professor, they formally petitioned against and resisted the push to incorporate MOOCs in their teaching saying that they refuse to enable the push of replacing professors and diminishing education for students in public universities (Kolowich, 2013). They indicated that, in their opinion, it is much more superior for a scholar to teach and engage with his or her students, than to have their students watch a video of another scholar teaching and engaging with other students (Kolowich, 2013). Furthermore, another concern is that there is an average of 15% completion rate of MOOCs, which means there is approximately 85% attrition, according to the comprehensive database of MOOC participation statistics developed by Katy Jordan (2015a). Some argue that the high attrition rates of MOOCs could be attributed to the diversity in both the learners' backgrounds in terms of demographics as well as motivations and aspirations for enrollment in the MOOCs (Yousef et al., 2015). However, we mustn't disregard an important issue about these completion rates. Some argue that MOOC completion is the wrong measure of course success and could be misleading, because learners interact with MOOCs very differently than for-credit courses that are either part of their degrees or for professional development, and they have varying intentions and motivations from either enrollment or completion. In other words, many learners enroll in MOOCs much the same way people window-shop; sometimes they are just curious so they enroll to have a look, or get a brief taster or introduction to the subject (Clark, 2016; Reich, 2014). As learners dig deeper into MOOCs, many of them often get sidetracked because of personal commitments, such as their jobs or families, since they are adult learners rather than college students. Therefore, many have argued that that course completion is not the appropriate way to judge MOOC success, since learners still benefit from MOOCs (Clark, 2013).

MOOC limitations and potential pertaining to Arab world

With regards to the Arab world specifically, it is important to note that there are challenges that face developing countries that make it difficult for participants to fully experience and benefit from MOOCs. To highlight a few of these: (1) Not only is the Internet cost high for some families in small towns and rural areas, but also when they are financially capable of paying for internet, it tends to be a poor internet connection there is poor internet connection in small towns and rural areas, if any; (2) the educational technology used in some of the MOOCs require advanced computer skills, which not many possess in the region; and (3) that most MOOCs are offered as well have material and content in the English language, which could limit access for learners who do not have English literacy (Adham & Lundqvist, 2015; Bali, 2014b). As Bali (2014b) put it, "while MOOCs were a great development in openness and access, they are not really benefiting the whole world because they privilege English-speakers, they increase the (colonial) Westernization of knowledge [and] they privilege people who can get online easily, because they have good internet access or technology skills." In her article on Arab MOOC development, Bali (2014b) posits that while it's a good advancement that Edraak is on its way to offering MOOCs in Arabic, she also has five cautions. One of these cautions is about Arabic being a complex language because Modern Standard Arabic is different from colloquial Arabic, which is contextualized by every country, thus this could potentially pose problems for lecturers, and the learners in understanding the lecturers' dialects. Another caution, or rather hope, is about cMOOCs and how it would be a positive thing for MOOC designers and instructors to either use this approach in MOOCs or even a mixed methods approach that combines both xMOOCs and cMOOCs, in order for content to be created by participants themselves (Bali, 2014b).

On the other hand, there are many opportunities for MOOCs to grow and flourish in the Arab world. One of the opportunities is that, according to Anant Agrawal, the Chief Executive of edX, many participants in their MOOCs are from the Arab world[1] so there is in general an awareness growing in the region about MOOCs as a concept and educational innovation, and in specific that content of these courses

[1] This is mentioned in an interview by Tadween Publishing, and Agrawal did not include a numerical indicator of how many Arab learners are on Edx. Upon researching this but to no avail; Edx's stats, according to their website, do not include country or region to determine learner location. They only collect age, education and gender demographics (Edx, 2018).

need to be translated and offered in Arabic (Tadween Editors, 2013). Another major opportunity MOOCs offer as a new educational technology is that they could assist students, alongside their traditional schooling, in understanding and grasping the material better and this in many cases could substitute private tutoring, which has become a major problem facing families in countries such as Egypt, Saudi Arabia and UAE today (Adham & Lundqvist, 2015). There are other platforms that have emerged to address this issue of private tutoring, such as Khan Academy, Nafham and Tahrir Academy. Overall, it seems that MOOC platforms have been positively received in the region and are expected to grow or gain more popularity in the upcoming years. According to Nafez Dakkak, the CEO of Edraak,

> "MOOCs will most likely not be the silver bullet that "fixes" higher education – if there will ever be a silver bullet in education (or any sector). However, with no Arab university ranked in the top 100 universities worldwide, and employers complaining about a serious skills gap, MOOCs have the potential to be part of an affordable solution that brings better quality higher education to the Arab world" (Dakkak, 2013, para. 15).

Edraak aims to put the Arab world at the forefront of educational innovation through presenting important opportunities that could play an integral role in the revolution of education and learning (Edraak, n.d.). Edraak, and other MOOC providers and open online resource providers in the region, offer the Arab world two main benefits: one is that it gave the Arab voice an opportunity to address the Arab audience in the Arabic language, which addresses the needs of individuals who do not have English literacy in the Arab world (Bali, 2014b). The other is that, through Edraak, Arab scholars can have a voice and be able to provide knowledge from the Arab world to the worldwide community (Bali, 2014b).

Thus, the disruption that MOOCs had in their early years hasn't quite materialized to fulfill those aspirations that were initially associated with them. In fact, according to Yuan et al.'s statistics referenced by Adham and Lundqvist (2015), they might not pose an extensive threat after all, as the large majority of students enrolling in MOOCs already hold university degrees and are looking for additional professional and educational development. As much as MOOCs have the potential to

be impactful, one must be cautious and look holistically at both the strengths and opportunities of such an educational approach. Additionally, we cannot simply generalize about MOOCs as being "all good" or "all bad" (Bali, 2014a). MOOC designs, participation, outcomes and expectations vary greatly from one MOOC to another, thus they need to be looked at individually rather than be evaluated as a whole genre (Bali, 2014a). Moreover, engagement differs from one learner to the other, due to both design-related and personal factors coming into play when learners join MOOCS. Also, because MOOCs are designed differently, which could be based on different learning theories, as will be shown in a later section of this paper, we cannot have generalized or blanket statements about MOOC designs leading to more or less engagement. Having said all the above, MOOCs are currently another important resource for learning that offers benefits as an interactive content delivery platform that could potentially develop a large number of people's educational experience (Hew, 2016; Krause, 2013). Thus, studying ways to further improve and develop their design and success is not only crucial but is also expected as a result of their potential impact (Damm, 2016).

It is important to note that MOOCs weren't initially created to substitute traditional higher education, but rather to improve or widen access to educational material, and later, learning communities. This paper does not aim to look at the implications of MOOCs on higher education, but rather to highlight their role as an additional form of learning as well as a professional development strategy, and offer insights from the study of one MOOC in the Arab world. Before starting the discussion of the research design, it is necessary to outline the key conceptual, theoretical and pedagogical frameworks that MOOCs build on in general, and that the different types of MOOCs embody in particular.

Conceptual and Pedagogical Frameworks of MOOCs

Without intentional, careful and contextual instructional design, any educational experience would face obstacles in reaching its full potential. A deeper look at the most important learning theories and pedagogical frameworks that scaffold the design of MOOCs is thus crucial. Anderson and Dron (2011) discuss the three generations of distance education pedagogies; cognitive-behaviorist; social-constructivist; and connectivist respectively. This may seem like the order in which

the types of MOOCs surfaced, but interestingly it's the opposite; a connectivist MOOC appeared first in 2008 (which is a theory that builds on some aspects of of constructivism) and then the cognitive-behaviorist MOOC appeared afterwords in 2011. Anderson and Dron (2011) specifically discuss distance education pedagogies, with a focus on the three presences (teaching, social, cognitive) outlined in the Community of Inquiry (CoI) model.

The pedagogy most commonly used in MOOCs is cognitive-behaviorist; a type of MOOC usually referred to as xMOOC. Historically, behavioral learning theory surfaced first, which attests that learning is defined as a new behavior or change in current behavior as a result or response to a stimulus or stimuli (Seel, 2011, p. 438). The focus of the behavioral learning theories lies on the individual and the importance of measuring these behaviors, rather than assessing attitudes or capacities (Anderson & Dron, 2011). Major behaviourist learning theorists include Edward Watson, John Thordike, and B.F. Skinner. The cognitivist theory of learning followed, which put the focus more on knowledge or capacity that are stored and recalled in an individual's memory, rather than behaviors. Part of the reason for cognitive pedagogy surfacing is because of the increasing need to consider motivation, attitudes and mental barriers, which might not all appear in observable behaviours (Anderson & Dron, 2011).

The combination of both of these learning theories lead to to the cognitive-behaviorist pedagogy of distance education, which became very prominent in most xMOOC designs throughout the last decade. Cognitive-behaviorist MOOCs mainly focus on a one-way learning approach, where there are short instructional videos and automated testing techniques to test the learners' understanding of the content presented in the videos (Rodriguez, 2012). Another definition is that they are free courses that are open to a large number of participants at once and are conducted using videos, online assignments and web-based assessment techniques (Adham & Lundqvist, 2015). Educational videos are predominantly used as an instructional tool with videos ranging between 5 and 10 minutes, and assessment is mainly through multiple choice tests, online self-assessment and peer assessment due to the high number of participants (Baturay, 2015). xMOOCs can also include discussion forums, where learners discuss and share ideas as well as resources, which is the social

constructivist angle, but these discussions are neither the main focus nor the space of learning planned in xMOOCs (Anderson & Dron, 2011). The main focus in this type of MOOCs is the instructor-lead content, which usually results in a more linear approach for the learners' learning experience in the MOOC (Quinn, 2012).

As with everything, there are advantages and disadvantages to xMOOCs. On the one hand, these cognitive-behaviorist models "defined the first generation of individualized distance education", increased access and student freedom, and made it possible to scale courses to accommodate very large numbers of learners at much lower costs than traditional courses (Anderson & Dron, 2011, p. 3). On the other hand, cognitive-behaviorist MOOCs (xMOOCs) are seen to have less teaching and social presence in the course, as well as formal models of cognitive presence (Anderson & Dron, 2011). Additionally, according to Vaill (1996), who is cited by Anderson and Dron (2011), while cognitive behaviorist models make learning outcomes clear, they "avoid dealing with the full richness and complexity of humans learning to be, as opposed to learning to do" (p. 3).

Afterwards, constructivism as a learning theory surfaced, which posits that learning is a collaborative process, learner centered, and requires learner activity without necessarily needing a teacher to play the role of the authoritative provider of knowledge, but rather the teacher becomes a guide or organizer of learning activities (Seel, 2011, p. 783). Constructivism puts the focus more on individual knowledge, beliefs, and skills emphasizing that the learner constructs their understanding through the combination of previous knowledge and new information (Seel, 2011). Additionally, there are two types of constructivism theories that emerged; cognitive constructivism, which was developed by Piaget in 1973; and social constructivism, which was developed by Vygotsky shortly after in 1978. Social constructivism as a theory emphasizes the importance of the social and cultural context for cognitive development; Vygotsky's concept *Zone of Proximal Development* maintains that learners can master concepts, which they cannot understand on their own, through the help of instructors and peers (Seel, 2011). Anderson and Dron (2011) discuss social constructivism in particular as the second generation of distance education pedagogy, which was made possible in distance education only with the affordances of the many-to-many communication of the web, which made it possible for learners to have

synchronous and asynchronous social learning experiences. The focus moved from the teacher being the instructor that pours knowledge into the minds of learners, to the teacher as a guide that shapes and designs learning experiences for these learners (Anderson & Dron, 2011). This is important because connectivism as a theory, which is the basis of the other common type of MOOCs, builds on concepts of constructivism and the earlier constructivist models of distance education.

The other common type of MOOCs are based on the connectivist learning theory; cMOOCs. Siemens published an article in 2004 called '*Connectivism: a learning theory for the digital age*' in which he explains that previous learning theories such as behaviourism, cognitivism and constructivism were established in an era that did not have today's technologies and did not highlight learning that occurred beyond the realm of organizations and institutions (Siemens, 2004). He maintains that connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories (Siemens, 2004). Connectivism is based on the ontological view that there is distributed knowledge, in addition to qualitative and quantitative knowledge, that occurs as a result of the diversity in opinions and across a network of learners and connections (Siemens, 2004). However, it is important to note that distributed learning does not connote connectivist knowledge without adding value to what it is connected to due to connectivist knowledge being emergent, chaotic, fragmented, non-sequential and contextualized (Siemens, 2004). In other words, connectivist learning does not occur in the realm of memorization and knowledge transfer, rather it is learning that happens based on learners making connections and ties between information sources, maintaining these connections for continued learning, making decisions in choosing what to learn and having the capacity to learn more than the information that is currently known (Siemens, 2004). Thus, the characteristics of cMOOCs are autonomy, diversity, openness, and interactivity (Siemens 2004; Downes 2012). Learning processes in cMOOCs are inherently personal and subjective because they are based on each learner setting their learning goals and deciding on their own level of engagement. In fact, in their definition of what a MOOC is, McAuley et al. (2010) put it in a connectivist frame, saying "a MOOC integrates the connectivity of social networking, the facilitation of an acknowledged expert in a field of study, and a collection of freely accessible online

resources" (McAuley et al., 2010, p. 4).

After outlining the pedagogies that underpin MOOC designs and types, it is important to consider these theories in terms of the application on adult learners, how they learn and how that connects with lifelong learning as one of the main motivations for learners who enroll in MOOCs. It is additionally important to consider these pedagogies in light of the differences between MOOCs and traditional for-credit face-to-face courses and traditional for-credit online courses as shown in Table 1 earlier.

Andragogy, Heutagogy, Self-directed learning and Self-regulated learning

Upon outlining the main approaches and theories of learning in MOOCs, it is important to contextualize this in relation to the idea that MOOC learners are most commonly adult learners, thus it's important to look into theories of andragogy, heutagogy, self-directed learning and self-regulated learning. Steffens (2015) maintains that it is critical for learners to have the ability to self-regulate their learning to a higher level than what occurs in traditional learning environments. Research aiming to explore intentions and motivation in distance education is varied, but throughout the scholarship on these topics, importance is given to andragogy, self-directed learning, self-regulated learning and heutagogy, which are theories or explanations of adult learning. Thus, this section will focus on discussing these in particular, which are crucial for this study, since the majority of learners in MOOCs are adult learners.

Andragogy

Much of the early research and scholarship on andragogy is credited to Malcolm Knowles, who proposed this concept in order to distinguish it from child or pre-adult education. Pedagogy is defined as "the art and science of helping children learn," while Knowles (1980) defined andragogy as "the art and science of helping adults learn" (p.43). The main pillars or assumptions underlying andragogy portrays the adult learner as an individual who (1) is independent in developing a self-concept and can direct their own learning, (2) has gone through life experiences that has become a rich resource for learning, (3) has learning aspirations related to society and social roles, (4) is interested in application of knowledge to solve problems, and (5) is intrinsically, rather than extrinsically, motivated (Knowles, 1980). Critique of this concept raises the question of whether it should be considered a theory at all, stating

that these are descriptions of "what the adult learner should be like" and this is descriptive of what is already recognized as good practice (Hartree, 1984, p. 205). Additional critique focuses on whether these characteristics are in fact strictly reserved for adult learners; since some adult learners are not independent and often rely on teacher structure, may be extrinsically motivated and that some children are self and intrinsically motivated (Merriam, Mott & Lee, 1996). It is however important to note that Knowles himself did not frame this concept as a theory stating that it is simply a set of assumptions about adult learning or is a conceptual framework that aims to be the basis for an emergent theory (Knowles, 1989). Additionally, Davenport and Davenport (1985) classify andragogy as a theory "of adult education, theory of adult learning, theory of technology of adult learning, method of adult education, technique of adult education, and a set of assumptions" and noted that it could in fact be coined as a theory if empirical studies were made to test these underlying assumptions (p. 158). However, studies done to test the validity of this theory by looking into the difference between instruction of adults and pre-adults have yielded different conclusions (Merriam & Caffarella, 1991).

Self-directed learning and self-regulated learning, and the difference/similarity between both

Self- directed learning, according to Knowles (1975), is a process in which "individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes." It is important to state that this process does not exist in isolation, in other words it usually takes place in association with mentors, teachers and/or peers, who have a sense of mutuality. This can be said about many MOOCs, since most of them are designed to integrate discussion boards where peers and teachers interact with each other. Self-regulated learning stems from the construct of self-directed learning, and has considered students' independence in learning. Pintrich (2000) states that self-regulated learning is an active, constructive process where learners set goals for their learning and attempt to monitor, regulate and control their cognition, motivation, behavior, guided and constrained by their goals and contextual features on the environment. Zimmerman (2000) has explained self-regulated learning

as “self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals” (p.14). Three phases of self-regulated learning have been identified: forethought, performance and self-reflection and the ability of one to self-regulate their learning depends on affective and cognitive factors as well as contextual-environmental factors (Zimmerman, 2000; Pintrich, 2000; as cited in Littlejohn et. al, 2016). Self-regulated learning has emerged in relation to offline formal learning contexts (Zimmerman, 2000), but Littlejohn et al. (2016) cites research studies (Azevedo & Cromley, 2004; Barnark-Brak, Lan & Paton, 2010) that have linked self-regulated learning to academic achievement in online learning environments. Additionally, there are five sub-processes associated with self-regulated learning, which represent Zimmerman’s three phases, as concluded by Littlejohn et. al (2016): 1) motivations and goal setting, 2) self-efficacy, 3) task interest value, 4) task strategies, and 5) self-satisfaction and 6) evaluation.

It is clear that both constructs are very similar, for many reasons, one of which is that they both focus on lifelong learning as a basis for these theories (Saks & Leijen, 2014). A main difference between them though, is that self-directed learning is a concept of adult education from the 1970s-1980s whereas self-regulated learning is more recent and stems from the fields of cognitive psychology and educational psychology (Saks & Leijen, 2014). Another difference is, because self-directed learning discusses the adult learner it is typically used to describe learning activities outside traditional school environments and involves designing learning environments, whereas self-regulated learning mostly studies the school environment, but should not exclude the idea of designing a personal learning environment (Jossberger et al, 2010). Additionally, in self-directed learning the focus is on the learner having the freedom to manage and control their learning tasks so it is more on the macro level, in self-regulated learning, the teacher or guide may also be in control of the learning activities and the learner is usually concerned with processes of task execution, thus is more micro-level (Jossberger et al, 2010; Loyens et al, 2008). The best way to consider the difference is in the scope of each construct; self-directed learning may include self-regulated learning but not the opposite, in other words, a self-directed learner is expected and is supposed to self-regulate but a self-regulated learner may not self-direct (Jossberger et al, 2010).

Heutagogy

Heutagogy is a form of self-determined learning, with ideas and practices stemming from andragogy. It is best described as an extension to pedagogy and andragogy, which basically is learner-centered (Hase & Kenyon, 2000). Heutagogy frames learners as the major agents in their own learning, as highly autonomous and self-directed individuals, who self-determine their capacity and development, which results from personal experiences (Hase & Kenyon, 2000). In other words, a heutagogical learning environment facilitates and emphasizes the development of learners' competencies and capacity to learn (Ashton & Newman, 2006; Hase & Kenyon, 2000). The root of the principles of heutagogy is that people know how to learn, which is particularly relevant in describing learning in open and distance education contexts, in general, and to learning that occurs when social media is used, in particular (Wheeler, 2012). The importance of heutagogy for this research is due to it being proposed as a theory that applies to emerging technologies in distance education and to guide distance education practices and educators to deliver instruction using new technology, such as social media and Web 2.0 tools. This frames this theory as "net-centric" that makes use of the affordances of the Internet with regards to distance education and the digital age of teaching and learning (Wheeler 2011; Anderson, 2010). New technology in education has created a need to consider new pedagogical approaches, since andragogy was beginning to seem outdated in the light of recent changes and development in teaching methods, digital media and resources (Wheeler, 2011). Additionally, the ethos of heutagogy "extends the learner choice, where students can create their own programs of study, a feature often seen in the loose and unstructured aspects of some MOOCs" (Wheeler, 2012, para. 3).

Concepts such as motivation for student engagement and course completion, intention of enrollment in MOOCs and self-regulated learning are prominent in the literature with regards to the overarching concept of student engagement and MOOCs, it is thus imperative to clearly highlight them.

Intention, motivation and reasons for MOOC enrollment

What motivates learners to learn? To answer this question, we must first discuss the construct of motivation, but since motivation differs from one person to

another it does not have a universal definition. However, most psychologists concerned with learning and education use the word 'motivation' to describe those processes that "can (a) arouse and instigate behavior, (b) give direction or purpose to behavior, (c) continue to allow behavior to persist, and (d) lead to choosing or preferring a particular behavior" (Wlodkowski, 1985, p. 2) In many instances student engagement is used interchangeably with the term 'motivation' (Hew, 2016). Reeve (2012) offers a clear distinction between the two terms by indicating that student engagement could be understood as the observable manifestation of motivation, while motivation itself refers to the reasons why a certain emotional, physical or cognitive response occurs. MOOCs differ in pedagogy, design, accreditation and completion rates than traditional online courses. A major difference between these two types of fully online courses is completion. This is due to the fact that a large percentage of students who enroll in MOOCs do not complete the entire course, which usually does not pose any financial problems for learners since they free courses and dropping out does not cost them a fee (Parr, 2013), whereas in university courses, most students who enroll complete the course (Lee et al., 2014). A study showed that even at universities that have an approximately half dropout rate, students are still completing their courses at a rate almost seven times higher than the average MOOC (Lee et al., 2014). MOOC completion rates are significantly low and attrition rates are significantly high (Lee et al., 2014). According to Anant Agarwal, Chief Executive of edX, from the participants who pay to receive a certificate for MOOC completion, an average only 60% successfully complete the course (As cited in Damm, 2016, p. 142). This is an important statistic that needs to be paid attention to, because these high attrition rates seem to be a principal point of concern and criticism of the efficacy of MOOCs as a course genre for offering quality educational experiences (Damm, 2016).

Reasons for this phenomenon vary; however it is important to note that MOOCs are a fairly new educational innovation and pedagogy, in the sense that MOOCs have only started being offered less than a decade ago (first cMOOC was in 2008 and first xMOOC was in 2011). So in a way they are still finding their ways, whereas distance education started in 1873 with the The Society to Encourage Studies at Home, the first correspondence schools in the US (Miller, 2014), and online university courses started in the 1980s after the affordance of the Internet, when the

Western Behavioral Sciences Institute started an online program (Miller, 2014), and of course traditional face to face university courses have even had centuries of practice in teaching and learning methods and overall pedagogies (Lee et al., 2014). Many sources discuss the concept of learner intention and motivation from enrolling in MOOCs in relation to these low completion rates. The majority of learners enrolling in MOOCs have goals other than finishing the full course such as exploring the MOOC format or that they are simply curious. However, the most prominent aspiration learners mention is to learn more about a subject area rather than completing a course (Lee et al., 2014). Because of the large enrollment numbers and the extremely wide variety of participants' backgrounds, there is a wide range of learners' motivation for enrolling in a course and thus a lack of a single, linear learning process and progression followed by all students (Littlejohn et.al, 2016). Studies have also explored the role that participants' educational backgrounds, demographics and gender play in course engagement and successful online learning experiences (Guo & Reinecke, 2014).

In order to fully and holistically understand student engagement in MOOCs, it is imperative to move beyond the constructs of completion and retention rates outlined by learning analytics, into the realm of motivations and drive to engage in these courses (Littlejohn et. al, 2016). Strong links between learning in informal online learning environments such as MOOCs and the concept of self-regulated Learning have been established in the literature (Littlejohn et. al, 2016; Guo & Reinecke, 2014). According to the research conducted by Littlejohn et. al (2016) on participants in a MOOC (n=788) titled Data Science offered by the University of Washington that attracted 50,000 participants from 197 countries, the majority of participants researched in the MOOC with high self-regulated learning scores, pursued the MOOC for professional development purposes. This then indicates that their motivation was intrinsic in that they aimed to acquire knowledge and skills relevant to their workplace and their professional advancement, rather than the extrinsic motivation related to passing assignments or receiving a course completion certificate (Littlejohn et. al, 2016). Moreover, a study conducted by Veletsianos, Reich and Pasquini (2016), who interviewed 92 participants in a MOOC, found that much of the learning that MOOC participants go through happens in spaces outside of the MOOC

platform, namely their workstations, the ecology of online learning, which is where they form study groups and search for online additional materials, and in the broader context of their lives (Veletsianos et al., 2016). They indicate that "learners are situated in particular places, in particular communities, with varying levels of commitment and engaging multiple strategies to overcome the hindrances they face" and these activities are rooted in learners' goals and environments (Veletsianos et al., 2016, p. 7). Thus it is important for MOOC developers not only to examine learners' emergent behaviors on the course platforms and aim to support those behaviors, but also to design tools and interventions to support learners' self-regulated learning strategies (Veletsianos et al., 2016). This leads to the conceptualization of MOOCs as an informal learning environment where participants are able to determine, independently, which course materials and activities to interact with and to which extents, based on their needs and motivations for enrolling in the course (Littlejohn et. al, 2016). Therefore, student engagement in MOOCs is likely to be impacted and linked to learner motivation and self-regulated learning. Hence, the interviews conducted for this research study, as is explained in the methodology section, include questions about motivation and aspirations for enrollment as well as self-regulated learning behaviors.

Relating to professional development

MOOCs are also growing in popularity in relation to professional development. Lee at al. (2014) cite several news sources and MOOC platforms such as Edx, Coursera and Udemy (2013), that announced how there is an increasing number of employers becoming interested in adopting MOOCs for internal corporate needs, trainings and development (as cited in Lee et al., 2014). In educational institutions however, they are not as widely accepted or encouraged for credit. This goes back to the fact that education for the majority of educational institutions is a source of revenue but it is costly for corporates and governments. Thus the latter are more likely to accept MOOC credits than universities or colleges, which could potentially be financially threatened by MOOCs as low-cost or free courses (Lee et. al, 2014), or concerned about issues of control in MOOCs and quality issues related to how MOOC learners are assessed. In addition, many students who pursue MOOCs for personal interest or curiosity in the subject become engaged and complete the course

due to the extrinsic motivation of receiving a certificate of completion that adds to their certifications and skills for potential professional development (Hew, 2016).

Lifelong learning

The majority of learners on MOOCs often use them for lifelong learning. Lifelong learning, according to the OECD report Steffens (2015) cites, refers to the idea that individuals do not learn only in formal education institutions such as schools, universities and adult education institutions, but can also learn in non-formal as well as informal settings such as at work, at home and in the wider community during their lifetime from early childhood to learning in retirement (Steffens, 2015). According to Steffens (2015), one of the first official accounts of the term lifelong learning being used in international discourse was by Edgar Faure, the Director General of UNESCO and chairman of the Commission in his introductory letter in 1972. He said, "only an over-all, lifelong education can produce the kind of complete man, the need for whom is increasing with the continually more stringent constraints tearing the individual asunder" (as cited in Steffens, 2015, p. 41). As a result of and following this report, the UNESCO Institute for Education began to focus on lifelong learning and education, which resulted in the institute being renamed as the UNESCO Institute for Lifelong Learning (Steffens, 2015). Moreover, lifelong learning became one of the cornerstones of the Education For All agenda in 1990, according to the Inter-Agency Commission (1990), and the World Education Forum framework for action in 2000 was designed "to enable all individuals to realize their right to learn and fulfill their responsibility to contribute to the development of their society" (UNESCO, 2000, as cited in Steffens, 2015, p. 41). One of the cornerstones of heutagogy strongly supports lifelong learning; reflective practice, which is a "critical learning skill associated with knowing how to learn" (Hase, 2009, p.49).

MOOCs support and embody lifelong learning and focus on the vision of on-demand learning for individuals who are not able to enroll in traditional education due to working full time (Kop, Fournier & Mak, 2011). Additionally, educators have been encouraged to develop lifelong learners who can thrive in and contribute to the global knowledge economy by being able to effectively apply skills and competencies as well as creatively address new situations in our constantly changing and complex world (The World Bank, 2003). With regards to the Middle East and the Arab world,

Dina Kiwan (2014) who is now a Former Professor at the American University in Beirut (AUB), stated in an article on AUB News, that "there is an urgent need for the Arab region to develop its capacities for learners' needs and open the routes to higher education and vocational training by developing an accessible flexible system and approach for lifelong learning" (AUB, 2014). This quote establishes a relationship between the development of a culture around lifelong learning and the context of the Middle East and the Arab world.

Definition and Importance of Student Engagement

Student engagement has been defined differently in the literature because it is an abstract construct (Hew, 2016). In any learning environment, whether face-to-face, online or blended, student engagement is considered a crucial prerequisite for learning (Guo, Kim & Rubin, 2014). In general terms, student engagement is linked, in the short term, to acquisition of grades, as indicated by Lam, Wong, Yang and Liu (2012) who are cited by Hew (2016), and on the long term it could potentially be linked to the individual academic achievement and self-esteem (Hill & Werner, 2006). Definitions commonly depend on the context and often with regards to the mode of course delivery. In general terms, student engagement pertains to the extent students are involved and actively participate in learning activities (Cole & Chan, 1994).

The National Survey of Student Engagement (NSSE) defines student engagement as "the time and energy students devote to educationally sound activities inside and outside of the classroom" (as cited in Vaughan, 2010, p. 60). The NSSE developed ten Engagement Indicators which were categorized into four themes; a) Academic Challenges, which has the indicators of higher-order learning, reflective and integrative learning, learning strategies, quantitative reasoning; 2) Learning with Peers, which has indicators such as collaborative learning and discussions with diverse others; 3) Experience with Faculty, with has the indicators student-faculty interaction and effective teaching practices; and 4) Campus Environment, which has the indicators quality of interactions and supportive environment (NSSE, 2017). It is important to note however that the NSSE was developed, validated and is conducted with higher education university students, which is a very different educational model than MOOCs as is shown in Table 1, but the concepts that are used to define and categorize engagement are relevant and important to highlight, since they are also

related to the CoI model's presences to a large extent.

Additionally, scholars often refer to and identify student engagement as a concept that includes three major and interrelated components: behavioral engagement, emotional engagement and cognitive engagement (Fredricks, Blumenfeld & Paris, 2004). According to Helme and Clarke (1998) and Fredricks et al. (2004) behavioral or physical engagement relates to how much a student participates in activities or discussions and attends class meetings. Emotional engagement focuses on student's feelings and affective responses towards the teacher, peers, the course and the learning process in general. Finally, cognitive engagement reflects the task-specific mental process that a student utilizes when working on a course activity. These three major components of student engagement are very similar to the three presences explained in the Community of Inquiry (CoI) framework, which are teaching presence, social presence and cognitive presence. This framework is discussed in depth in the following section. The definition that will be employed in this study is a combination of the above in addition to the one Kuh (2009) introduces; "the more students study a subject, the more they know about it, the more students practice and get feedback from faculty and staff members on their writing and collaborative problem solving, the deeper they come to understand what they are learning" (as cited in Meyer, 2014, p.6). According to Meyer, this definition emphasizes "how engagement results when the students' involvement in learning (such as participating in a discussion or collaborating on solving problems) contributes to their learning and sustains their further involvement in course activities" (Meyer, 2007, p. 6). All the aforementioned definitions strongly relate to the CoI presences (teacher presence, social presence and cognitive presence), and emotional presence, which is a fourth addition that was recently introduced in the literature on CoI. Therefore, this research study will utilize the CoI framework in the research design, data collection and the data analysis.

The Community of Inquiry Model

The Community of Inquiry model (CoI) focuses on the importance of developing an online learning community in order for knowledge to be constructed, which can be created through the combination of three forms of presence; social,

cognitive and teaching (Garrison et al., 2000). According to the authors, it is through the combination and proper inclusion of these presences, by both the teacher and the students, that a constructive and useful learning environment can be fostered. The CoI model was created to "define, describe and measure the elements of a collaborative and worthwhile educational experience" (Garrison, Anderson & Archer, 2010, p. 6).

The study upon which Garrison et al. (2000) based the CoI framework was situated in university graduate-level programs conducted through computer mediated communication, which makes it appropriate to be applied in this study because; a) graduate level university students are considered to be adult learners and so are the majority of MOOC learners; b) learners in graduate-level programs are not required to enroll in these programs but rather do so for professional development and more in depth learning of certain areas in their fields, and so are the majority of MOOC learners; and c) both of these learning experiences are conducted only online, thus making both contexts very similar. In fact, the main difference is that graduate-level courses are for-credit, while MOOCs are often not for credit, although many MOOCs are now being offered for credit and can count towards graduate-level degrees. The reason this research study did not utilize the NSSE for example is because it was developed and applied strictly on undergraduate learners, who are enrolled in face-to-face programs at universities, which makes this context very different from MOOC learners in many ways. Accordingly, this CoI framework was utilized in this research design as well as analysis.

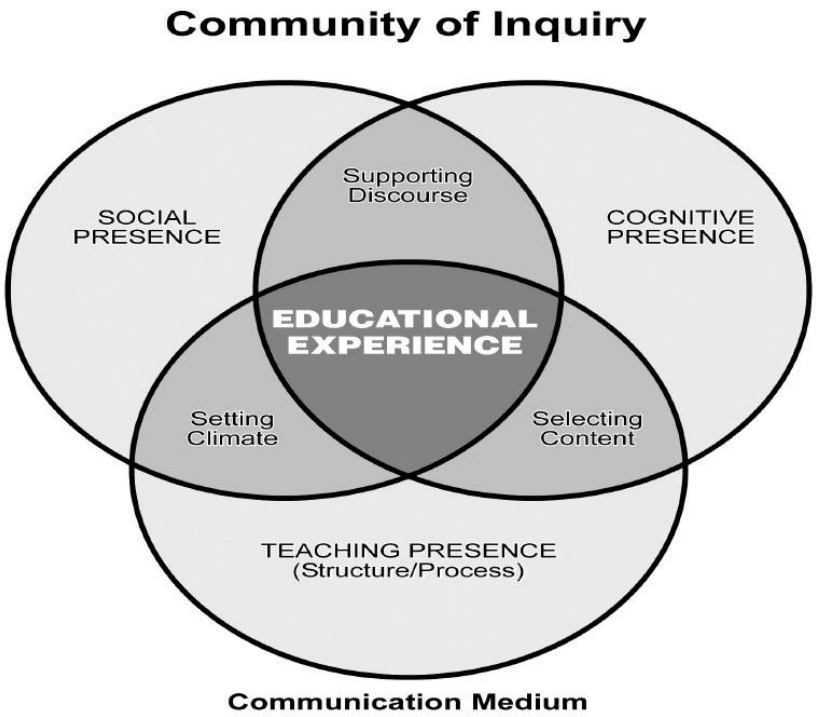

Figure 1: Community of Inquiry Diagram

(Garrison, Anderson & Archer, 2000)

The elements that foster student engagement in an online course:

Teaching presence

This is the most important element of the three, because teaching presence is the binding element in creating a community of inquiry, since without the teacher neither social nor cognitive presences can occur (Garrison et al., 2000). This is even more so in online learning spaces, because learners are not even physically gathered in the same room, so the teacher brings these presences together for the learners to experience them. Teaching presence emphasizes the importance of instruction in terms of designing, organizing and facilitating productive discourse and conversations among students (Garrison et al., 2000). The importance of instructor presence in online environments has been discussed in the literature. For example, Dixon (2010) cites the works of several authors (Gayton and McEwen, 2007; Young, 2006) in stating that online instructors should be actively involved in the students' learning processes (as cited in Dixon, 2010). This involvement could be achieved through activities such as engaging in online discussions (Levy, 2008; Shea, Li, and Pickett, 2006; Young, 2006) and using emails appropriately (Dennen, et al, 2007; Gayton and McEwen, 2007, Levy, 2008) (as cited in Dixon, 2010). Dixon (2010) also borrows

from Shea, Li and Pickett (2006) in stating that "effective design, facilitation and direction of cognitive and social processes" define good teacher presence. This is in fact posited in Garrison et al.'s (2000) original framework explanation. Dixon conducted a research study of 186 students from six campuses in Midwest USA, and concluded that instructor presence in these students' online courses correlates with student engagement (Dixon, 2010). Online educators do not only face the challenge of providing their students with meaningful educational experiences and training but also need to intentionally design the course to foster a positive learning environment that would require the students to utilize and apply the concepts they learn in the course, which would lead to course completion and engagement (Centner, 2014; Kuh & Zhao, 2014). Ke discusses how online educators could benefit from blending or immigrating features of the face-to-face setting to online environments. This could be done through the processes of 1) course design – such as using presentations and organizing course materials, 2) design of online learning interactions – such as online discussions' purpose, format and quantity, 3) design of learning evaluations – such as quizzes and assignment (both online and offline) and 4) interface design- which is the visual design and navigation of the course website and the content (Ke, 2010).

According to Britt, instructors do not need expensive tools and technologies to engage their online learners; they need to focus on designing effective learning experiences through the inclusion of authentic learning such as real world problems, role-playing experiences, case studies and problem-based activities (Britt, 2015). Britt cites the works of Donovan (1999) and Shepard (2008) in saying that solving real-world problems leads to student engagement because through these activities students reach the highest level of Bloom's Taxonomy. While this might seem difficult to be established in online environments because of the requirement of collaboration and communication among students, Web 2.0 tools are increasingly offering the possibility of students to be engaged in these learning experiences (Britt, 2015). Because it is the instructor that creates and maintains the online learning community and environment, teaching presence is "core to establishing and maintaining social and cognitive presence" (Garrison, Innes & Fung, 2010, p. 35). Therefore teaching presence plays a central role in "establishing and sustaining an online learning environment and [in] realizing intended outcomes" (Garrison, Innes & Fung, 2010, p.

35; Shea & Bidjerano, 2009). However, as much as sustained instructor presence in the course encourages participation and engagement and leads to the moderation and direction of discussions, it is imperative that the teacher does not become excessively responsive and involved in online discussions (Garrison & Cleveland-Innes, 2005).

Teaching presence is much more challenging in MOOCs due to their massive nature and the rapidly changing technologies (Anderson & Dron, 2011). It is important to note that this element of CoI relates to *teaching* presence rather than *teacher* presence, which is a role that participants themselves can play in MOOCs where they exchange resources and have discussions; so learners can learn from each other as well as from the teacher in MOOCs. Additionally, teaching presence could differ based on the type of MOOC offered. Strong teaching presence can't quite manifest in xMOOCs in particular, which are pedagogically designed to be "self-contained and complete, requiring only teacher-learner interaction for marking and evaluation" (Anderson & Dron, 2011, p. 3). Also, in cMOOCs, teachers are not the only ones responsible for "defining, generating, or assigning content" but rather teaching presence occurs in cMOOCs through designing learning paths and interactions as well as supporting these learner interactions (Anderson & Dron, 2011). This idea that instructors need to intentionally design effective learning experiences outlined here includes fostering an interactive and collaborative community (relating to social presence) and establishing a community in which higher level or critical thinking and discourse takes place (relating to cognitive presence), which is a clear manifestation of the overlapping nature of the CoI model.

Social Presence

Social presence is defined as "the ability of participants in the Community of Inquiry to project their personal characteristics into the community, thereby presenting themselves to other participants as real people" (Garrison et al., 2000, p. 89). The communication context that occurs through "familiarity, skills, motivation, organizational commitment, activities and length of time" in using the communication medium directly affect social presence (Garrison, et al., 2000, p. 95). Social presence focuses on the need for online learners to project themselves, actively learn and interact with and perceive their peers as "real humans" (Garrison et al., 2000). Additionally, according to Lambert & Fisher (2013), "it is possible that when

incorporated into a distance learning environment, a sense of community might improve student retention and engagement in learning" (p.1).

The importance of social presence cannot be understood without also considering cognitive presence, because social presence indirectly facilitates the process of critical thinking that the community of learners go through, which supports cognitive presence. Additionally, social interaction among learners facilitates collaboration, which occurs when learners share experiences, construct knowledge and confirm meanings and this is also an affordance of social presence as presented by CoI (Garrison, et al., 2000).

There are also numerous researchers who have investigated the importance of collaborative learning and student interaction in relation to active student participation and motivation (as cited in Hassanien, 2007). "[C]ollaborative learning facilitates the active exchange of ideas within groups, increases motivation among the participants, promotes critical thinking [and] fosters socialization" (as cited in Hassanien, 2007, p. 135). In online learning, there is an importance of transmitting secondary communication information such as facial expressions and verbal intonation therefore videos provide more social presence cues than audio or text (Wise et al., 2004). Social presence is established easily in face-to-face settings as a result of the visual cues that take place, which could be challenging to create in online communities that lack this non-verbal form of communication (Garrison et al., 2000).

Moreover, the second of the five benchmarks outlined in the National Survey of Student Engagement (NSSE) is active and collaborative learning, both alone and with peers, and this includes activities such as group projects and discussing questions with other students (NSSE, 2017), which reinstates the importance of collaboration for engagement to occur. Dixon concludes from her study that developing "real connections in online courses" in imperative in helping students be engaged within the course (Dixon, 2010, p. 9). Also, social presence is related to student-to-student interaction as well as student-to-teacher interaction (Wise et al., 2004). In their research study, Kim et al. found that interactivity was a good predictor of social presence in that the students felt socially present and acknowledged by others when there was more participation among them in course activities (Kim et al., 2011). Additionally, mandating student participation in discussions such as providing the

minimum accepted level of participation can foster social interaction and engagement in the learning community, especially early on in the course (Kim et al., 2011). Therefore, because distance learners can often feel isolated and lonely, a learning community where students interact and see the usefulness of this interaction is crucial for the establishment of social presence in online courses (Kim et al., 2011).

In Su et al.'s research on the importance of interaction in web-based education, "94 percent of survey respondents believed that interacting with other students and instructors created more meaningful learning experiences" (Sue et al., 2005, p. 13). This research also found that students "do not want interaction to be limited to academic topics, but also want to know each other better to build a more cohesive learning community" (Su et al., 2005, p. 9). Furthermore, in their research study, Sung & Mayer (2012) concluded the following five practical factors that could increase interaction by nurturing online social presence within higher distance education environments: "social respect (e.g. receiving timely responses), social sharing (e.g., sharing information or expressing beliefs), open mind (e.g., expressing agreement or receiving positive feedback), social identity (e.g., being called by name), and intimacy (e.g., sharing personal experiences)" (p. 1738). Social presence is what differentiates a collaborative community of inquiry that discusses ideas from simple downloading of information (Garrison et al., 2000). There is an "indirect or mediating effect of social presence on cognitive presence" (Garrison, Innes & Fung, 2010, p.32) and cognitive presence is a "mediating variable" between social and teaching presence (Garrison, Anderson & Archer, 2010).

Cognitive presence

Cognitive presence essentially relates to the learning and inquiry process (Garrison, Innes & Fung, 2010). The authors define cognitive presence and say that it occurs through this four-phase process; 1) definition of a problem or task (triggering event); 2) exploration for relevant information or knowledge (exploration); 3) making sense of and integrating ideas (integration); and 4) testing plausible solutions (resolution) (Garrison, et al., 2001, p. 4-5). Cognitive presence is also defined as the extent to which learners "are able to construct meaning through sustained communication" (Garrison et al., 2000, p. 89).

In one research study the authors found that while students enjoy and learn

from reflecting on discussion posts, they feel lack of immediacy and spontaneity because of the asynchronous nature of online environments (Stodel et al., 2006). Stodel et al also cite several research studies that have similar findings in that while online students find the reflective aspects of discussion forums beneficial, they tend to be a challenging aspect in an online course because they could sometimes be abstract, non-interactive and non-interrelated (as cited in Stodel et al., 2006). Garrison et al. also state that "the extent to which cognitive presence is created and sustained is partly dependent on how the communication is restricted and encouraged by the medium" (Garrison et al., 2000, p.93). Shea and Bidjerano refer to Garrison et al.'s notion that cognitive presence "reflects higher-order knowledge acquisition and application and is most associated with the literature and research related to critical thinking" (as cited in Shea & Bidjerano, 2009).

As cited by Garrison and Cleveland-Innes, for students to reach a high level of critical thinking and knowledge construction, there must be an organization and cohesiveness in the interaction and discourse (as cited in Garrison & Cleveland-Innes, 2005). Moreover, creating cognitive presence and achieving high levels of learning depend on the quality or substance of interaction activities rather than on the quantity (Garrison & Cleveland-Innes, 2005). The findings of one research study suggest that the combination of three teacher-created elements creates and sustains cognitive presence in online educational environments (Garrison & Cleveland-Innes, 2005). The first element is design and organization, which could be done through defining clear expectations, selecting manageable content, structuring appropriate collaborative and individual activities, having assessment activities that lead to fulfilling the intended objectives of the course (Garrison & Cleveland-Innes, 2005). The second and third elements are facilitating and directing discourse in order for students to confirm their understanding of concepts and to create meaning, this could be achieved through the instructor setting clear requirements of discussions such as deadlines and length, providing engaging questions, challenging and testing ideas, focusing the discussions, modeling good contributions and ensuring the discourse is progressive (Garrison & Cleveland-Innes, 2005). Garrison and Cleveland-Innes (2005) also cite Garrison and Anderson (2003) in stating that the objective of deep learning is to lead and transform the process from exploration and interaction to resolution.

In her research, Dixon (2010) refers to Gayton and McEwen's (2007) notion that students feel involved in an online course when they have student collaboration, discussions of thought-provoking questions, dynamic interaction and rapport. The activities students reported as engaging in Dixon's study were; application-based such as applying concepts to case studies and solving problems; discussion forums about the concepts; current events assignments; group projects and research papers (Dixon, 2010.) In order for cognitive presence to be achieved in an online course, it cannot be isolated from social and teaching presence, on the contrary, it is the teaching presence that leads to the development of both cognitive and social presences (Garrison & Cleveland-Innes, 2005).

There are many factors cited in the literature that have an effect on student engagement in MOOCs. For example, a mixed methods research study conducted by Hew (2016), on three top-rated MOOCs in programming languages, arts and design, and literature with a sample of 965 participants, concluded that the design factors that participants perceived to have had a positive impact on their engagement were: "(1) problem-centric learning with clear expectations, (2) instructor accessibility and passion, (3) peer interaction, (4) active learning, and (5) course resources to address participant learning needs" (Hew, 2014, p. 328). These factors clearly correlate with the three presences outlined in the CoI framework. The first factor, problem-centric learning with clear expectations, the fourth factor, active learning, and the fifth factor, course resources to address participant learning needs, relate to the cognitive presence in the CoI model. The second factor, instructor accessibility and passion relates to the teaching presence outlined in the CoI model. The third presence, peer interaction, relates to the social presence in the CoI model. However, it is important to note that the CoI model maintains that these presences overlap and intertwine, thus many of the factors outlined by Hew (2016) fall in the domain of more than one presence. There are other indications in the literature that have student engagement factors similar to the three CoI presences. For instance, Chickering and Gamson (1987) outline seven principles of effective teaching, all of which relate to the CoI presences. The principles of student-faculty contact, prompt feedback, respect for students' diverse talents and ways of learning, communicating high expectations and emphasizing time on task relate to the CoI teaching presence. The principle of student-student contact

and cooperation relates to the CoI social presence, and the principle of active learning relates to both the social and cognitive presences of CoI.

CHAPTER III: Research Design and Methodology

This research aims to offer an in-depth understanding of the factors that affect learners' engagement in one MOOC, what some of the learners attribute to their high or low engagement, and what that means through the CoI framework lens. To fulfill this purpose, this study utilized a case study approach that uses mixed methods, which is an approach that combines both quantitative and qualitative approaches in the research (Creswell, 2012; Ponce & Pagan-Maldonado, 2015). In case study research, the focus "is in the process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation" (Merriam, 1988, p. xii), which relates to the exploratory overarching goal of this study. The quantitative research element was included in order to analyze the learning analytics data to see if there is a relationship between engagement as determined by the learning analytics, through watching videos and solving problems, and each of the community of inquiry presences (RQ2), as well as other variables (RQ1). In a study conducted by Ramesh, Goldasser, Huang, Daumé and Getoor (2013) that used learners' behaviors on MOOC platforms, such as interacting with the material, posting to the discussion board, answering quizzes or solving problems, they were able to outline two types of engagement: passive and active. Quantitative data could show patterns of learner behavior on the platform as well as interaction with the platform, instructor and other learners, and some descriptive statistics of the MOOC learners' data. The qualitative element through the interviews was introduced in the research design, because one cannot truly attempt to explain engagement without looking into individual motivation, self-regulation and intention from engaging in the MOOC (Littlejohn et al., 2013). As is highlighted in the learning analytics section, there are limitations to learning analytics, which cannot explain authentic engagement and learning at a deeper level. This chapter includes the description of the research context, the methodologies used for data collection, the sampling method and sample, as well as the analysis of the results and ethical considerations.

Research Questions and Hypotheses

Research Question 1

What is the nature of the relationship between engagement in watching videos and solving problems, and Demographic variables (e.g. gender, age, education level) and other pre-MOOC survey data (e.g. goals for joining the MOOC, previous MOOC experience). Please see Appendix E for Pre-MOOC survey questions.

Research Question 1 Hypothesis (H_1)

There is a relationship between learner engagement and the following learner variables; goal from joining the MOOC, previous MOOC experience, knowledge and work in the MOOC subject, age group, primary occupation, feeling a sense of achievement from completing MOOC requirements, self-motivation in the absence of instructor.

Research Question 1 Null Hypothesis (H_{01}) (For chi square testing)

There is no relationship between the learner's level of engagement in watching videos and solving problems, and each of these variables.

Research Question 2

What is the nature of the relationship between low/high engagement and perceptions of weak/strong social presence, teaching presence, and/or cognitive presence in the E-Marketing MOOC?

Research Question 2 Hypothesis (H_2)

There is a relationship between learners' level of engagement in watching videos and solving problems, and each of teaching presence, social presence and cognitive presence.

Research Question 2 Null Hypothesis (H_{02}) (for Chi square test purposes)

There is no relationship between the learner's level of engagement in watching videos and solving problems, and each of teaching presence, social presence and cognitive presence.

Sampling

According to Creswell, purposeful sampling occurs when "researchers select individuals and sites to learn or understand the central phenomenon" (Creswell, 2012, p. 206). Therefore, this is the most appropriate sampling technique to use in this study

because participant selection was from a specific MOOC to find an in-depth understanding of the elements that had a relationship to their engagement in the course. Creswell defines homogenous sampling as when "the researcher purposefully samples individuals or sites based on membership in a subgroup that has defining characteristics" (Creswell, 2012, p. 208). Because data was collected from learners who were either engaged or disengaged in the MOOC, these were the defining characteristics of these subgroups. The MOOC chosen for conducting this study was titled *E-Marketing*, and was offered by Edraak.

Description of the Research Context

The E-Marketing MOOC was offered via Edraak, taught and designed by one instructor, who had two teaching assistants. The instructor has many years of work experience in the field of E-Marketing and Social Media Marketing. One of the teaching assistants has experience in these fields so was helping the instructor answer questions on the discussion board and acted as her second eye, while the other teaching assistant is in the field of IT, therefore was chosen to be an assistant in order to help with the instructional technology and platform technicalities, including uploading videos, creating pages for the course, handling the MOOC platform…etc. The MOOC duration was 4 weeks, beginning on 31 October, 2017 and ending on 30 November, 2017. This was the third iteration of the MOOC, since it was reported to be a successful MOOC the first two times by the learners, which the instructor told me in the interview.

The E-Marketing MOOC, according to the interview with the instructor and my own observation of the course on Edraak, was designed to include the following elements and activities:

- Short instructional videos about content and theories relating to E-Marketing, Social Media Campaigns and Strategies...etc. were uploaded each week (the number of videos differed each week)
- One video of an interview with an expert in the field was uploaded at the end of each week, to discuss how they conduct their E-Marketing and social media strategies, and how those strategies were successful for their businesses.
- A weekly quiz was posted at the end of each week, with questions about the instructional videos in order to assess the degree to which the learners understood

the content. The number of quiz questions differed each week. Learners who received a score of 70% or higher on these quizzes received the MOOC completion certificate.

- The usage of the discussion board was not included in the MOOC design; in other words, there were no requirements or prompts to direct learners to these discussion boards. However, some learners asked questions on the discussion forums, which resulted in the instructor, the teaching assistant or other learners responding to these questions. Most questions were technical, asking for information about the certificate issuance and video uploading date…etc., but some were about the content. During the interview, the instructor indicated the reason for designing the MOOC not to have high learner interaction or be project-based is because it's an introductory MOOC, with the main goal of providing the learners with the information or the content, rather than building projects together, however the instructor along with the instructional design team at Edraak said that if they design a follow up MOOC to this one, with more advanced topics, it would have a more project-based focus, which would be heavily dependent on participant interaction and discussions.

This MOOC could be characterized as an xMOOC, since it was mainly focused on instructional videos offering content and quizzes on these videos to assess whether learners grasped the content or not. There was also no planned social interaction in the MOOC to promote constructivist and connectivist learning, which further affirmed the classification of this MOOC being an xMOOC.

Data Collection

With regards to data collection, six methods were used: 1) learning analytics, 2) the CoI Survey, 3) the Pre-MOOC survey, 4) interviews with some learners, 5) MOOC instructor interview, and 6) my own observation of the MOOC.

Learning Analytics

Learning analytics were utilized to highlight student engagement levels. They provided information on the total number of videos watched, the total number of problems attempted, the total numbers of HTMLs visited, the total number of discussion board posts, the total number of post comments; as well as all the aforementioned by each week separately. Engagement was coded to be either high or low, based on a calculation of the quartile range, as shown in table 7.

Edraak provided these analytics, as they already have a system in place to

collect this specific information, as declared by the Head of Engineering and Research department at Edraak, Dr. Sherif Halawa. The disengaged participants were selected based on the same criteria but in the inverse, which is a low number of videos watched and low number of problems attempted or solved.

Learning Analytics and limitations

Multiple scholars have attempted to measure student engagement in online learning environments and there are multiple research studies focusing on learning analytics as a potentially explanatory method for students' experiences in MOOCs. Learning analytics, as defined by the Society for Learning Analytics and Research in 2011, is "the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environment in which it occurs" (SOLAR, 2017). Learning analytics are well known to be used as Course Signals on Learning Management Systems (LMS), in order for educators to be able to identify how their learners were performing throughout the learning experience, by identifying at risk students, who were students that are performing poorly or aren't interacting with the learning materials uploaded to the LMS, and be able to better support them, or learners who were doing well in terms of viewing content and performing well (Siemens, Dawson & Gašević, 2015). As a result of the massive enrollment rates in MOOCs and the nature of MOOCs as a web and computer based platform, they create massive data sets about students' online interactions and activities (Coffrin et. al, 2014; Khalil, Taraghi & Ebner, 2016). Thus creating a significant opportunity for researchers who are concerned with learning analytics not only to develop an understanding of students' online learning experiences, processes and outcomes but also to highlight patterns of engagement with online learning material and activities (Coffrin et. al, 2014; Prinsloo & Slade, 2013). This is because there is potential in such online learning environments to track video interactivity, mouse clicks, quiz performance, time spent on tasks and course material, material downloads, number of logins and discussion forum activity and posting (Khalil, Taraghi & Ebner, 2016). While learning analytics, if interpreted appropriately, can potentially explain student behavior and levels of interaction with the online learning platforms, and thus inform educators and instructional designers to develop learning experiences for student success, they also have constraints and

limitations (Khalil, Taraghi & Ebner, 2016).

An important limitation relates to how much data sets and numbers can in fact explain meaningful learning, which is a vague construct on its own, and progression. Learning analytics use quantitative data, which can explain patterns and behaviors by number of clicks and platform logins or video exposure, but can it really explain meaningful learning? Dringus (2012) outlined two main points or concerns with regards to meaningful data in learning analytics: 1) if the data does not have meaningful evidence or clarity about measurements of meaningful learning and 2) if the collected data does not have an effect or impact on changing education or improving it. Additionally, while learning analytics are filled with data, there is limited information in them to capture internal and external conditions for learning (Siemens, Dawson & Gašević, 2015). Measuring internal conditions for learning refers to measuring aspects like goal achievement or cognitive load, and measuring external conditions of learning refers to aspects like instructional design, social context, previous learning history with the use of a particular tool, interpretation of findings (Siemens, Dawson & Gašević, 2015). In other words, it seems promising to automate many measurements about learning, but learning analytics' main focus is on outcomes without much consideration of learning and teaching processes, a focus which could have detrimental consequences on the interpretation of the learning analytics and the long term development of such an affordance (Siemens, Dawson & Gašević, 2015). In addition, a study conducted by Ebner and Khalil (2016) about patterns of learner engagement in MOOCs using learning analytics concluded that extrinsic factors are not enough to make students committed to the MOOC; intrinsic factors are imperative as well. They observed two different MOOCs that taught different subjects, and concluded that even though the MOOC subjects, and learners, were different, learner engagement patterns and behaviors were very similar in both courses. Of course engagement, because it has to do with motivation and self-directed learning, could differ from one learner to another and from one MOOC to another.

Another element of concern about learning analytics is the issue of privacy (Drachsler & Geller, 2016; Khalil, Taraghi & Ebner, 2016; Prinsloo & Slade, 2013). There seems to be some uncertainty and questions among researchers about ethics and privacy of using learner information such as email addresses, names and basic

personal information. Prinsloo, Slade and Galpin (2012) mention the stance held by Cloggy (2011) and Duval (2011), who maintain that learning analytics could bureaucratise students' learning and become more of panoptical or surveillance method, rather than empowering students (as cited in Prinsloo et al., 2012). In an attempt to address these concerns, there is the recommended solution of the anonymization approach (Khalil, Taraghi & Ebner, 2016). Additionally, there are questions of consent, interpretation of data, ownership and transparency in that MOOC or online course providers need to take participants' consents to collect and analyze this data for research purposes (Khalil, Taraghi & Ebner, 2016; Prinsloo & Slade, 2013). This is why in some of the research on this topic there is a recommendation for educators and MOOC developers to adopt the CIA model, which stands for Confidentiality, Integrity and Availability (Khalil, Taraghi & Ebner, 2016). Also, Prinsloo and Slade (2013) suggest a sociocultural framework for the use of learning analytics, which "highlights the role of power, the impact of surveillance, the need for transparency, and an acknowledgment that student identity is transient, temporal, and context-bound construct" (p. 1150).

All these points about the concerns and limitations are equally valid and valuable in informing researchers about how to collect and what to collect data about, which in turn informs the interpretation process of this data meaningfully for successful and engaging learning experience designs. Therefore, in efforts to be mindful of these limitations, angles and concerns around learning analytics, it was not the only data collection and analysis method in this research. Three other data collection methods have been identified, which are the CoI survey instrument, interviews with participants and the Pre-MOOC survey. With regards to the concern about consent and privacy, in the analytics used for this research, learners who did not give their consent for their information to be used in this study, were removed from the datasets along with their data, and learners' email addresses were kept confidential during the research process, and will remain anonymous for the research report.

Community of Inquiry Survey Instrument

The CoI measurement survey was sent to MOOC participants in order to gather feedback on their perceptions of teacher, social and cognitive presences in the course, aiming to explore the relationship, or a lack thereof, between CoI presences

and engagement levels. This instrument has been developed and validated by a collaborative research team, consisting of the following scholars, in alphabetical order: Ben Arbaugh, Marti Cleveland-Innes, Sebastian Diaz, D. Randy Garrison, Phil Ice, Jennifer Richardson, Peter Shea and Karen Swan. According to the CoI Survey page on the Athabasca University website, the results of this survey development and validation study were presented at a conference by Sloan Consortium (now Online Learning Consortium), one of the leading entities in the field of online learning excellence. A "three factor solution with oblique rotation was presented. All variables loaded cleanly on the expected factor/presence. This suggests a stable instrument that could be used in a variety of studies, including large scale inter-institutional or cross-disciplinary studies" (Athabasca University, CoI). In addition, there was another article of a study by Swan et al. (2008) that discussed, at length, the multi-institutional development and validation of the instrument in order to operationalize Garrison, Anderson and Archer's Community of Inquiry framework published in 2000. The results of that study suggest that the "instrument is a valid, reliable, and efficient measure of the dimensions of social presence and cognitive presence, thereby providing additional support for the validity of the CoI as a framework for constructing effective online learning environments" (Athabasca University, CoI). In a study by Damm (2016) using the CoI survey instrument to measure student engagement in eight MOOCs, the results indicated that this instrument can effectively measure students' engagement in MOOCs, with a caveat. The results of this study indicated that the survey can assess the efficacy of the design and implementation of the course, but not whether low engagement can be attributed to peer interaction. This means that it was adequate in confirming that cognitive and teaching presence are indicators of student engagement in a MOOC, but social presence was not. This is because a correlation cannot be linked between low engagement and weak social presence due to the fact that reasons for dropout tend to be personal, such as participants having other commitments, lack time to work on the MOOC…etc. (Damm, 2016). In addition, the study also concluded, from the survey and the additional interviews conducted, that the large class size negatively affects how students interact with each other and there was a recommendation for dividing students into smaller groups for interaction and social presence creation and for

student to feel that they are part of a community, which as aforementioned, has been demonstrated to be instrumental to increasing student engagement in online learning environments (Damm, 2016).

The translated Community of Inquiry Survey that was sent to the E-Marketing MOOC learners had the 34 questions of the CoI instrument, with 4 extra questions: 1) indication of consenting to participate in the research (1st question in the survey), 2) indicating email addresses if willing to be contacted for interview (after the 34 CoI questions), 3) indicating telephone number that can be used to contact them, 4) and the final question was about the preferred meeting time for conducting the interview. The questionnaire was sent to all learners enrolled in the MOOC in the third week of the MOOC, and the data was downloaded from the survey platform on December 11th, which was about 12 days after the MOOC was finalized.

Edraak's Pre-MOOC Survey

In addition to the above data collection methods, Edraak routinely sends learners a pre and post MOOC survey. The Pre MOOC survey had questions about the learners' demographics, such as their gender, education degree, age group, and questions asking about their goal from joining the MOOC, their primary motivation from participating in the MOOC, their preferred language of learning, whether they were enrolled in a MOOC previously, and their knowledge level about the MOOC subject. The Pre MOOC survey also had six likert scale questions asking learners to indicate level of agreement with six phrases. The Pre-MOOC survey responses were analyzed in order to answer Research Question 1 of this study. IRB and CAPMAS approval were both obtained for this survey as well as the other data collection methods. Additionally, the learners who did not indicate their consent were removed from the datasets that were analyzed for this research study.

Interviews

In an effort to gain a deeper understanding of student engagement in this MOOC, interviews were conducted with consenting participants with higher than average engagement and participants with lower than average engagement in the MOOC, in order to gather a deeper understanding of the reasons they attribute to either their high or low engagement. The number of the interviews initially planned was 10 interviews, but I was only able to conduct 6 interviews in total. This is as a

result of the limited duration for the research study, and the lack of enough responses and willingness of learners to participate in an interview. In addition to questions about the factors and design elements these two sets of participants credit to their engagement, or lack thereof, interview questions also touched upon their motivations for being engaged and enrolling in the MOOC. This is as a result of, as aforementioned, motivation and self-determination theory being of importance in driving engagement and completion in MOOCs.

Reporting on Interview process

In the CoI survey, there was a question that asked participants to indicate their willingness to participate in interviews. I emailed those learners to request an appointment for an interview. The total number number of these learners who indicated willingness to participate in interview: 105. 6 emails bounced back with a mail delivery failure. The total number of learners who responded to the email was 22; of those, only 7 participants committed to the scheduled appointments, and those were the ones that were interviewed. There was a limited time to reach out to more learners. For learners with Gmail accounts, the method of interviewing was Hangouts on Air so that the interview could be recorded and transcribed at a later time. For learners with email accounts other than Gmail, the method of virtual interviewing was via Zoom, which was also recorded to be transcribed later. The interview questions were semi-structured, for the full interview questions please see appendix B.

Instructor Interview

Before the MOOC began, I interviewed the instructor in order to understand what the pedagogical design of the MOOC is, what are the assessment methods she planned for, how she planned for learner interaction...etc. Most of the results from this interview are presented in the 'Description of Research Context' section of this paper, and some quotes from the instructor are presented in relation to the Community of Inquiry chi square test results and discussion.

MOOC Observation

In addition to the data collection methods already outlined, I also enrolled in the MOOC and conducted an observation of the MOOC platform, design and organization, interaction on discussion board posts and comments, videos, quiz

questions...etc. I did not fully participate, however I briefly watched some of the videos. The most important insights from my observation were about how the learning analytics record interaction with the videos and the quality of the discussion board posts. I present my observation of how the MOOC was designed, assessed and planned also in the 'Description of Research Context' section.

Ethical considerations

Permissions were acquired from the Head of Engineering and Research department at Edraak, Dr. Sherif Halawa, to conduct this research using the Edraak platform analytics and to send out the CoI survey. In addition, all course participants were informed about the research study at the beginning of the MOOC in an email and asked to participate in this study. Also, as aforementioned, participants who didn't indicate consent were removed from the dataset and their data was not used for this study. The purpose of this research study was disclosed to participants willing to participate in this research. Interview participants' names and identities were kept confidential and pseudonyms or code names were used in the presentation of results. Participants were asked to click on a button in each of the surveys to virtually indicate their informed consent and interviewees were asked to give a verbal consent for being recorded in order for me to transcribe and analyze the data at a later stage. The informed consent explained to learners that : a) their participation is voluntary; b) withdrawal from the study is possible and will result in no harm to the participant; and c) confidentiality will be assured both by the researcher and Edraak.

Credibility and Trustworthiness

Triangulation was employed in that data was collected through learning analytics, the CoI survey, the Pre-MOOC survey and interviews in order for there to be multiple explanatory data sources. Additionally, I explained the context of this research in detail in order to promote transferability of the research study. However, because this MOOC took place over the internet and had massive numbers of participants from various geographical locations in the Arab World and the Middle East, contextual information that is important to note, if the results are to be transferred, are the course subject, relevant discipline, gender, background and culture of participants. Additionally, below is a detailed report on the handling of the data, including handling of missing data and rationales for each decision taken about the

data collected.

Reporting on Data Handling

Missing data and matching datasets

Learning Analytics were generated automatically for each user who viewed at least one page of the MOOC from the start date until the date of data analysis: 10 December, 2017, whether these learners conducted any of the course activities (watched videos, attempted problems or posted or commented to the discussion board), or did not conduct any. (This was reported to me via email from Sherif Halawa, Head of Research team at Edraak). Participants who were considered engaged were the ones that, through the learning analytics, were demonstrated to be interacting with the learning materials (visiting videos, since there was no other form of materials posted), and interacting with activities (attempting to solve problems, since there was no other type of activity). Discussion board posts and comments were removed from the results and interpretation because they represented a limited number of posts (N=257) and comments (N=958), and because they were mostly about technical questions so they were not analyzed for content. I removed all data for all individuals that had a 0 in *both* videos watched and problems attempted, because that meant that they did not interact with the course activities. But if there were a 0 in one variable and a number in the other variable, that participant's data was kept. Then I used SPSS to obtain the averages and descriptive statistics, which were used to map out high and low engagement levels.

For the Community of Inquiry Survey

I translated CoI survey back to English and coded responses for the likert scale (in response list). Also, I put all questions on the same line (some were on different lines because each presence had a title, categories and a number of questions below each category, to make the analysis easier and give a title to each questions I put the presence name, the category and the question all in the same line (in each question). These titles were then shortened and given initials to make the analysis easier in SPSS and Excel.

The CoI survey responses were initially a total of 546. Regarding participants who entered the CoI survey and didn't respond to any of the questions, they were removed from the sample. Also, participants who solved some of the CoI survey and

not the rest, these were analyzed separately; if an individual responded to the majority of the survey, the remaining (empty) responses were substituted with the neutral response (3). However, if the individual responded to only a few questions and the majority of the questions were not answered, this individual's response to the whole survey was removed from the data set, and accordingly from analysis. After this step, I used SPSS to determine the descriptive statistics that were then used to highlight weak and strong presences.

After that I removed participants who didn't match with learning analytics. The resulting sample size was N = 126, which is what was imported into SPSS for conducting the chi-square test.

For the Pre-MOOC Survey

The questions that did not relate to my study in the Pre MOOC survey, were not included in the analysis. For example, the question about the nature of the learners' current occupation was coded (when they chose from the list, including those who chose 'other'); however, the follow up question of 'if other please indicate' was an open ended question and its responses were not included, as the main aim was to find out if the learners had an occupation related to the MOOC subject or not.

Then I removed all individuals who entered the Pre MOOC survey but had no responses to the questions. Additionally, learners who did not click on the 'I consent to participate in this research' were removed from all data sets.

Each variable was coded (See appendix E for codebook). There were some responses coded based on ordinal values and some nominal values. The coding for questions with more than one answer possible, were given a unique coding system in order to be able to distinguish from the total number which answers were selected, which would not be possible with the standard continuous coding system.

The Report Cards, is a dataset with information on what the total score of each learner enrolled is and whether they are eligible to receive the certificate of completion or not (indicated with a Y and No, later recoded to be 1 and 2). Learners who scored 70% or higher on the quizzes/problems received the MOOC certificate of completion.

Matching Individual data across data sets

Since the main aim of this research was to look at the relationship between

variables, it was very important to match individual learners' data across all data sets, in order to analyze their responses to the surveys and their analytics in order to examine the relationship between these variables, which were included in different data sets so it was important to match them. In order to match the data, the email addresses were used, because the respondent IDs did not match in any of the data sets, and the user ID format in the learning analytics (appear to be numbered in order) was different from the respondents IDs in the all surveys (appeared in this format: 6569942620). The Pre MOOC survey had learners individually enter email addresses; thus, this might have had an effect on the data that matched with the automatically generated emails in the Learning Analytics and Community of Inquiry Survey. Additionally, the Post MOOC survey did not ask respondents to enter their emails, nor did it collect the respondents' emails automatically, thus the Post MOOC survey responses were not included in this research.

After cleaning the data from zeros and the unrelated questions in the previous step, I then matched and consolidated all the data from learning analytics with the Pre MOOC survey, and then again with the CoI, making two different consolidated sheets to answer each of the research questions. The learner data that did not match with other data sets were removed. The following matches in the data sets were made:

Pre MOOC & Learning Analytics & Report Cards

This means that learners who did not have *both* Learning Analytics data and Pre-MOOC survey responses were removed from this data set. The report cards analytics were issued for all learners who were enrolled.

CoI Survey & Learning Analytics

Learners who did not have *both* Learning Analytics data and CoI Survey data were removed from this data set.

In the SPSS Chi Square test, I removed learners who gave N/A or other in response to the question on gender. The remaining sample size after removing the above, for the Pre MOOC and Learning Analytics were: N = 2,040. Additionally, after running the Chi square test on the Pre-MOOC survey and the learning analytics, to find relationships between certain variables and engagement with watching videos and solving problems, for the likert scale questions of the Pre MOOC there was a range of 3 to 4 % of zero responses, which was giving a false significance in SPSS. This is

because the Chi square test first counts the degree of freedom (the number of possible responses) in order to calculate the significance. So the fact that there were zeros, it was changing the df count, which in turn was confusing the whole calculation of significance. Since, zero wasn't a possible response in the survey, it just means that there was no response given to that question if there was a zero, so it shouldn't be counted in the Chi square test as a possible option. Therefore, I removed the participants who had all zeros to these six likert scale questions (N= 58). Participants with two or more zeros, and remaining inputs were response sets were also removed. This led to N = 1975 participants remaining with learning analytics and pre-MOOC responses to the 6 likert scale questions. Upon examining the data exported from SPSS, it appeared that only two of the questions (pertaining to the self variable in both watching videos and solving problems) was statistically significant. However, before conducting the process of removing the zeros and re-running the chi-square test, there were eight questions that had statistical significance.

Data Analysis

With regards to the data analysis, there were two methods used, one for the quantitative aspect and another for the qualitative data.

Note on translation process for all data in the research study

The MOOC was taught in Arabic, so the CoI instrument, consent forms and interview questions were initially in English but then were translated to Arabic. I consulted with a certified translator, who helped translate the CoI instrument and the consent form. Then I translated the interview questions using my own knowledge of both languages. We both used Al Maany, which is a good and accurate online tool for translation, for confirming some of the translation for certain terminology. Then I translated the CoI instrument questions back to English and used the English version of the Likert scale (Strongly Agree to Strongly Disagree). As for the interviewing process, I conducted the interviews in Arabic, then upon listening to the recordings I translated to English and transcribed them on the spot because the analysis and the writing were both in English. Since the interviewees were from different countries in the Arab world, I was worried about the dialects and accents but this did not turn out to be an issue for translation, except for a few instances when I didn’t understand their slang terminology I asked for clarification, which they willingly provided, and I often

repeated the statements back to them to check if I understood them correctly. The interview questions were written in Modern Standard Arabic.

Chi Square Test

First a cross tabulation was done, in order to conduct the Chi Square Test. A cross tabulation "is a table that shows the number of cases falling into each combination of the categories of two or more variables" (Muijs, 2011, p. 99). A Chi-square test is used "to determine whether a relationship observed in a contingency table is statistically significant" (Christensen & Johnson, 2012, p. 508). this test was applied on the data sets in order to show if there was a significant association between the variables of the Pre-MOOC and the CoI presences, against engagement, which was defined as video watching and solving problems. In the analysis for each of the statistically significant results in the Pre-MOOC survey, I included the interview responses that related to these variables. As for the associations that were not statistically significant, those were included in the appendix and referred to in the discussion.

Thematic Analysis of Interviews

The interviews were thematically analyzed using the three presences of the CoI and themes of motivation and self-regulation in order to explore the relationship or association between participants' engagement analytics and what they themselves attribute to their engagement or disengagement.

An important consideration in the analysis is the applicability to Arab learners in Arabic-language MOOCs as according to Brooks and Gaetane (2015) "conducting research in countries with different cultures and languages produces special methodological challenges" (p.58). Thus, this research was analyzed according to both the language of instruction and communication being Arabic and the cultural contexts of these participants. Interviews were conducted in Arabic, and translated to English for analysis and conclusions.

Analysis of the interview data depended on many factors to ensure that the data collected and measured and its interpretation is an appropriate measure for the research questions in this study. The analysis was conducted primarily through the CoI framework lens in the following ways: cognitive presence relates to viewing content, attempting to solve problems, time spent interacting with and studying course

material and applicability of content learned to learners' personal or professional lives; social presence relates to discussion board posting and interaction, communicating with peers through email or direct messaging and/or social media platforms; and teacher presence relates to organization and design of the MOOC, explanation of content, discussion board interactions between participant and instructor and communication with faculty through email or direct messaging in the platform.

CHAPTER IV: Presentation of Results

In this chapter, an overview of the MOOC learners' demographics and descriptive statistics are presented. Following that, the analyses of how low and high engagement were coded/calculated, and how weak and strong CoI presences were coded or calculated are presented. This is followed by a visual representation of learner engagement patterns across weeks. Then each of the research questions are answered separately using the Chi Square test results, along with some elements that surfaced in the interviews that relate to the variables and complement the information analyzed from the quantitative data. This section concludes with the discussion of the research study results, the limitations of the research study and recommendations for future research in the field of assessing engagement in MOOCs.

MOOC Learners Demographics

Total MOOC enrollment	29,564
Total learner analytics initially recorded	9,525
Total learner analytics after removing learners with no interaction with platform (Total number of learners with learning analytics (watching videos, solving problems, or posting to DB)	8,646
Total of number of learners without learning analytics (but visited at least one course page)	879
Total number of learners who were eligible to receive certificate of completion (i.e. scored 70 % or higher on the weekly quizzes)	1,397
Total number of learners who were not eligible to receive certificate of completion	28,166

Table 3: Numbers of Learners in MOOC and Learning Analytics

Figures 2 and 3 below offer demographic data about the MOOC learners that had learning analytics recorded in the dataset.

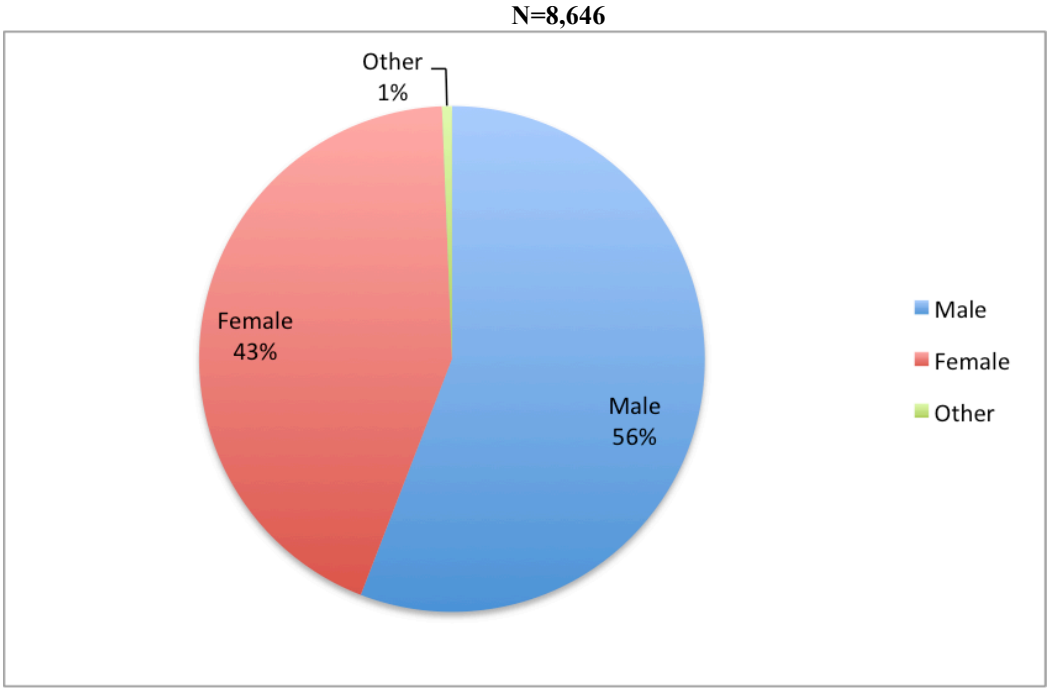

Figure 2: Gender distribution in the MOOC

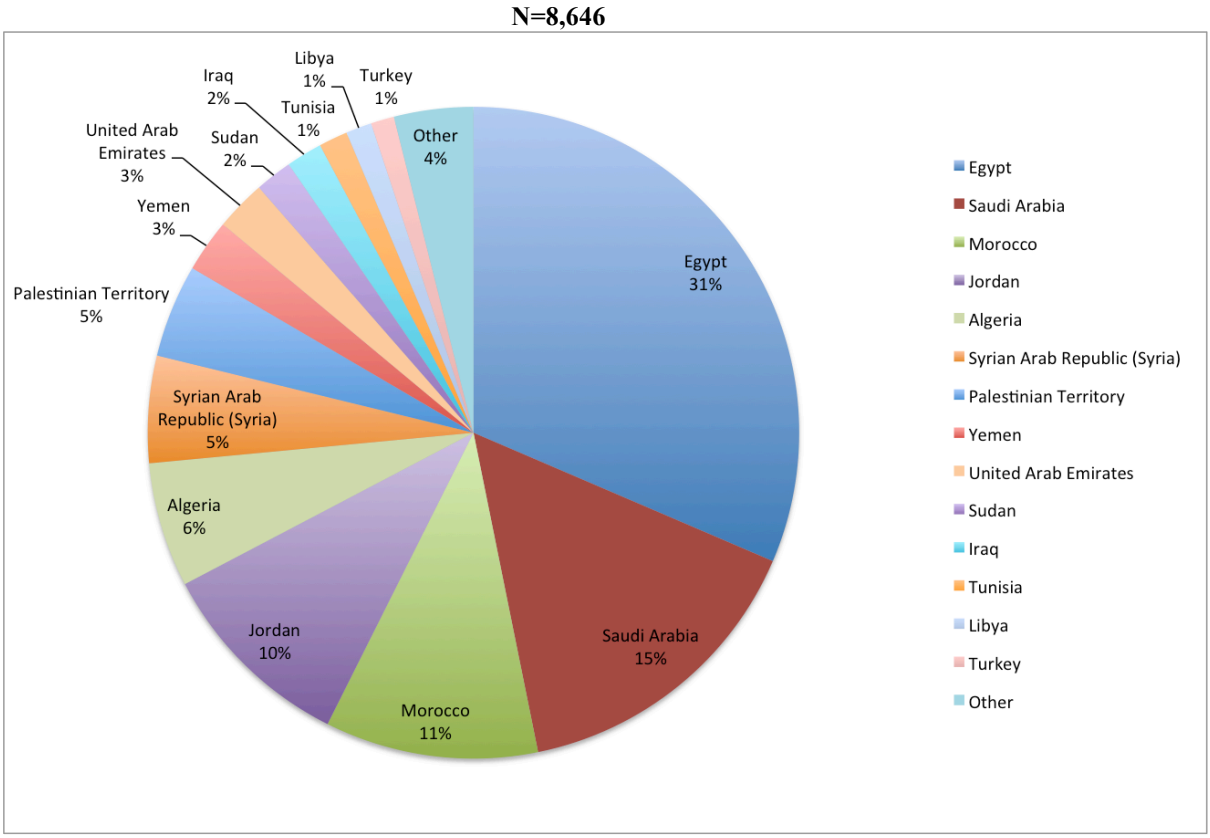

Figure 3: Learner distribution by country

Note: Countries with 70 or less learners enrolled from them, and learners who did not specify their country, were both grouped under 'other' and the percentages for all

countries, from the total number of MOOC learners who had learner analytics (N=8,646), were included.

Calculating low and high engagement of video watching and problem solving

The number of low and high engagement were calculated and coded based on the following: Upon examining the distribution of the data in the engagement analytics, we found that the quartile ranges are a relevant means of classifying the participants' engagement as either high or low. The total number of videos was 26 so the mean (average) was calculated as approximately 8. The lower than average numbers were accordingly from 0 to 8 videos, which were coded as low engagement = 0. The higher than average numbers were 9 to 26, which were coded as high engagement = 1. Similarly, the total number of problems was 66 and the average was calculated as approximately 20. The lower than average numbers were 0 to 20, which were coded as low engagement = 0. The higher than average numbers were 21-66, which were coded as high engagement = 1.

Descriptive Statistics

Table 4: Averages calculated for engagement

Average Videos Watched	Average Problems Solved
8.045263453	19.72940022
approx: 8	approx: 20
0-8 = low	0-20 = low
9-26 = high	21-66= high

Table 5: Standard deviation for engagement

Standard deviation videos watched	Standard deviation problems solved
8.744645471	26.98653988

Regarding the coding for weak and strong presences, the quartile percentage was used, as follows: The total number for each of the presences was summed, and then the quartile range was applied on the sums. Then, the median of the total was recorded, making for two lower quartile ranges and two higher quartile ranges. This worked well because there were large gaps between the two lower and two higher quartiles, which made a wide and clear division as to where the midpoint should be considered. These were interpreted as either weak perception of the presence or strong perception of the presence, as follows:

Table 6: Coding for Weak and Strong CoI Presences

Weak Teaching Presence (coded as 0) 13-51	Strong Teaching Presence (coded as 1) 52-65
Weak Social Presence (coded as 0) 9-34	Strong Social Presence (coded as 1) 35-45
Weak Cognitive Presence (coded as 0) 12-47	Strong Cognitive Presence (coded as 1) 48-60
Weak Total Presence (coded as 0) 34-133	Strong Total Presence (coded as 1) 134-170

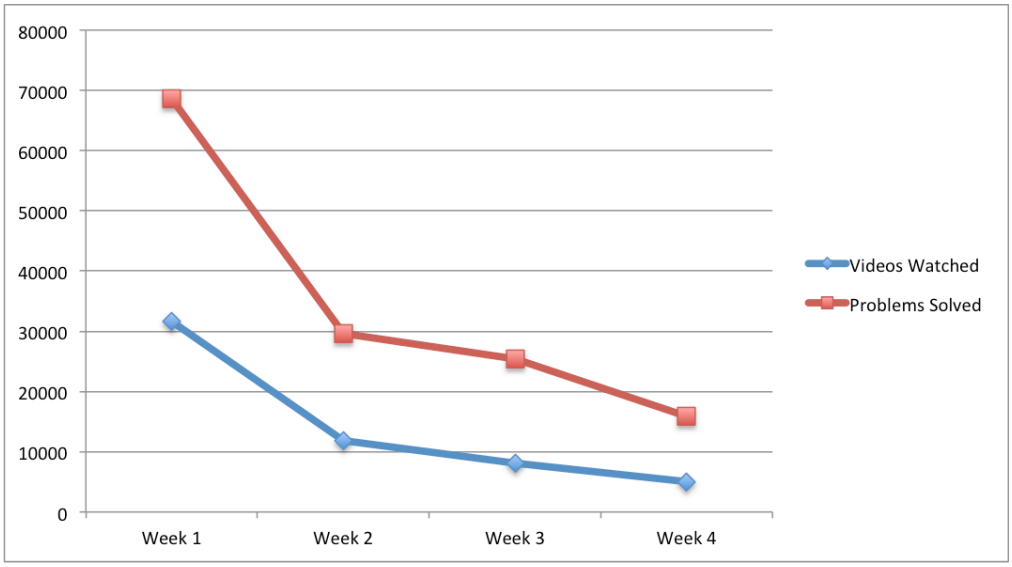

Figure 4: Engagement pattern of video watching and solving problems across weeks

It appears that engagement was highest in the first week, and then there was a steep decrease in the level of engagement both with videos and problems. However, the engagement remained similar, decreased only slightly, throughout weeks 2 and 3, and then by week 4 engagement with videos slightly decreased, but decreased strongly in solving problems.

Research Questions and hypotheses

Research Question 1

What is the nature of the relationship between engagement in watching videos and solving problems, and Demographic variables (e.g. gender, age, education level) and other pre-MOOC survey data (e.g. goals for joining the MOOC, previous MOOC experience). Please see Appendix B for Pre-MOOC survey questions.

Hypothesis for Research Question 1 (H_1)

There is a relationship between learner engagement and the following learner variables; goal from joining the MOOC, previous MOOC experience, knowledge and

work in the MOOC subject, age group, primary occupation, feeling a sense of achievement from completing MOOC requirements, self-motivation in the absence of instructor.

Null Hypothesis for Research Question 1 (H_{01}) (For chi square testing)

There is no relationship between the learner's level of engagement in watching videos and solving problems, and each of these variables.

The research hypothesis aims to explain what the direction of the research study is, however in order to conduct a statistical test, we test the null hypothesis as it's not possible to test a directional hypothesis with a statistical analysis.

The null hypothesis was accepted for some variables, and failed to be accepted for others, which will be indicated after each Chi Square test result, below. This means that my hypothesis for the research was accepted for some variables and rejected for others as will be shown for each of the variables in this section.

Below is a presentation of the results of the SPSS Chi Square test to explore the relationship between each of video watching and problem solving, and all the Pre MOOC survey variables. I've included all the cases that were statistically significant (Asymptotic significance less than 0.05). In some cases, there was significant interaction between video watching and one of the variables, but no significance between that same variable and problem solving, so these will be presented separately. However, those variables that showed a significant relationship for both video watching and problem solving are presented together. After noting that there is indeed significance, I examined the expected and observed counts to find which variable (or level of a variable) was responsible for the significant result. The expected count in each case represents a "model" frequency (calculated by the program, based on an internal algorithm) against which the observed values are tested. The formula for chi square test association will be included next to each variable according to the chi square test reporting formula: **Pearson Chi square χ^2 (degree of freedom, Number of sample) = Pearson chi square value, statistical significance ($p < .05$).**

Additionally, for the questions presented below (with a result of statistical significance), the relevant interview data is included in relation to each question. The remaining interview themes, which relate to questions that were not statistically

significant in the chi-square test, will be presented separately with the result of the chi-square test for that variable. For all the full chi-square cross tabulations generated by SPSS, please refer to Appendix D.

Variable 1: Goal from joining the MOOC, in relation to video engagement and solving problems engagement

This question asked the learners: What is your main goal for this MOOC?

Possible responses were (arranged based on the code given to each response):

1- Committed to completing all requirements of the MOOCs to obtain the MOOC completion certificate
2- To benefit from the content offered around the MOOC subject without commitment to obtain the MOOC completion certificate
3- Haven't decided the level of commitment yet
4- To know about MOOCs and trying them without committing to obtain a certificate of completion

An association between goal of joining the MOOC and watching videos was observed, χ^2 **(4, N=2040) = 12.3, p = 0.015. (p < .05)** and solving problems χ^2 **(4, N=2040) = 12.91, p = 0.012. (p < .05).** Upon examining the table, to see which cells were creating this significance, by comparing the expected and the observed count, there are the following observations; 1) learners with the goal of completing the MOOC requirements to receive a certificate engaged more in watching videos and in solving problems; 2) learners that enrolled in the MOOC to benefit from the content without the goal of obtaining the certificate engaged more in watching videos and less in solving problems, which makes sense since they enrolled to learn about the content rather than solve the problems and receive a certificate of completion; and 3) learners who enrolled in the MOOC with the goal of just learning about MOOCs in general, engaged even less in watching videos and solving problems.

As a result of this, I rejected the null hypothesis for this variable and accepted the alternative hypothesis: there is a relationship between the level of engagement of both watching videos and solving problems, and learners' goal from enrolling in the MOOC.

Variable 9: Watching videos and certificate eligibility (scoring 70% or higher on quizzes). This was the 9th variable in the Pre-MOOC Survey but is presented after the

1st variable as they are relevant.

The dataset shows whether or not learners received a certificate of completion:

Possible indications:

0 = No
1 = Yes

An association was observed between certificate eligibility and watching videos χ^2 **(1, N=1998) = 592.05, p = 0.000** as well as solving problems χ^2 **(1, N=1998) = 846.46, p = 0.000**. **(p < .05)**. This means that learners who were engaged in watching videos and solving problems received the certificate of MOOC completion.

As a result of the above, I rejected the null hypothesis and accepted the alternative hypothesis: there is a relationship between engaging in watching videos and solving problems and receiving the MOOC certificate of completion.

Insights from the interviews in relation to learners' goal of joining the MOOC, in terms of completing the requirements and receiving the certificate of completion:

Interviewee 1 (I1), whose previous job was Marketing Coordinator, and is now Digital Marketing Specialist was not eligible for receiving the certificate, had no learning analytics so was coded as lower than average engagement, CoI survey responses were mostly 'disagree' or 'neutral' (only 2 responses were 'agree'). I1 indicated the goal from joining the MOOC by saying,

> "*the more I read about the course information I found that it could help me in some things, because it has more technical aspects. Because in my university my courses were focused more on the theoretical aspect, especially in my post graduate, so the MOOC focused on the how more than the what, of how I can do a campaign online, how to create content on social media marketing."*

With regards to aspirations for obtaining the certificate, I1 said,

> "*for me, the main important thing is to receive the knowledge, then comes the certificate, because in Marketing when we go and interview for a job, the first thing they do is give us a test. I could bring in many certificates, but in my skills, I could be weak. So the first thing I focus on is to learn and have skills, then receive the certificate. Specifically in the Digital Marketing field."*

Another interviewee (I3) had a similar response to receiving the certificate saying that the main goal is to learn the content and was not interested in receiving the certificate. I3 had a higher than average engagement level, as determined by the learning analytics, watched all videos and solved all the problems, and received

the completion certificate. I3 had varied responses to the CoI survey, and no Pre MOOC survey responses. I3 has a Bachelor of Arts in English Literature and is currently working as a translator. I3's main goal from joining the MOOC was stated as,

> *"I have always thought of doing my own project and work, whether translation or other, starting my own business after gaining enough experience. I am generally interested in Marketing, I like taking topics on Marketing, and E-marketing is really what is happening right now."*

With regards to the course certificate, I3 said, "*I saw some people complaining about delayed issuing of the certificate. I couldn't understand how or why important this was. The most important thing for me is the learning process."*

Interviewee 6 (I6), however, did aspire to gain the certificate, but didn't log on the platform to confirm whether received it or not. I6 was eligible for the certificate, didn't have any video engagement data recorded in the learning analytics, so was coded as lower than average engagement in videos, even though I6 stated that they watched all the videos but on the app not on the platform. It was later confirmed by Edraak that their learning analytics system did not gather data from the app, only the web platform. I6 solved 64 problems, so was coded as higher than average engagement in solving problems. I6's CoI survey responses varied but had no pre- MOOC survey responses. I6 finished secondary school and is now in the first year of university studying Trade. I6 said, "*I wanted to get the certificate but I don't know why I didn't, even though I watched all the videos and solved all the problems."*

Variable 2: Knowledge about MOOC subject and engagement with watching videos & solving problems

This question asked the learners: How much do you know about the subject of the MOOC (E-Marketing)?

The possible responses were:

1- My work experience is in the same field
2- I am currently a university student in the same field

3- I have a university certificate (Bachelors, Masters Degree, Doctorate) in the same field
4- I read a lot about this field
5- I don't have knowledge about this field

An association was observed between knowledge about MOOC subject and watching videos

χ^2 (5, N=2040) = 11.18, p = 0.048. (p < .05) and solving problems **χ^2 (5, N=2040) = 14.15, p = 0.015. (p < .05)**. Upon examining the table, to see which cells were creating this significance, by comparing the expected and the observed count, there are the following observations; 1) learners who have work experience in the field, have a university certificate in the field, or read a lot about the field, engaged more with watching videos and solving problems; 2) learners who are currently university students in the field, engaged less with watching videos; and 5) learners who don't have knowledge about the field, engaged less with both watching videos and solving problems.

As a result of the above, I rejected the null hypothesis and accepted the alternative hypothesis: there is a relationship between knowledge about the field of the MOOC and engaging with watching video and solving problems.

With regards to the interviewees' knowledge about the field and their levels of engagement, their work and education fields varied; some worked and studied the field, while other didn't work or study the field but had aspirations to learn about E-marketing for either their professional development or having a side-business, which would benefit from E-marketing and social media knowledge. As aforementioned I1 works in the field and when applying for a job, skills in the field would greatly help in getting the job, but had a lower than average engagement in both videos and problems. I2 had higher than average engagement with watching videos and solving problems and works in the field of training, so benefited from *how* the MOOC was taught, as well as the content, which helped in some work-related aspects. I2 said

> "*these MOOCs give me experience in how to train, so I learn from others' expertise. Specifically, because now there is a direction towards e-training/online training, which is what Edraak is doing… It's important for me to know the details of the MOOC, the sequence, how it is presented. Also, the topic of e-marketing is a new field, and since I work in strategic planning...this MOOC was very beneficial for me in this field."*

I2 works in the Strategic Planning field, and also works in the field of training and

consultations for strategic planning, administration/business training, knowledge management, financial planning, and training of the trainers. I3 had higher than average engagement, yet had a Bachelor of Arts in English literature and is currently working as a translator. I3 said, "*I have always thought of doing my own life and work, whether translation, starting my own business after gaining enough experience…E-marketing is really what is happening right now."* I4 is a third year university student in Business Administration, which has some aspects related to marketing, and E-marketing is part of that. But I4 didn't engage with any videos nor problems, and joined the MOOC because was attracted to its name. I5 also had lower than average engagement and is a graduate of Eastern Languages, so not directly related to the subject of the MOOC, however wanted to gain knowledge for a private business saying, "*I was interested to know more about social media. My aim is to gain experience because I want to have a business of possibly selling my Calligraphy projects online."* Similarly I6 wanted the same thing saying, "*I like E Marketing, and that's what I want to do. One of the things I want to achieve in my life, I will be able to do it through learning about E-Marketing."* I6 had a higher than average engagement, but wasn't working or studying in the field, rather was in the first year of university studying Trade. Additionally, I7 had lower than average engagement, but is not working in the field, rather is an Arabic teacher in primary school. I7 said, "*I joined the MOOC for the love of this field, love of exploration and learning about this new great field."*

Variable 3: Previous enrollment in a MOOC and Video Watching + Problem Solving Engagement

This question asked the learners: Have you ever enrolled in a MOOC before?

The responses were:

1- Yes
2- No

An association was observed between whether the learner was enrolled in a MOOC before and their level of engagement in watching videos χ^2 **(1, N=2040) = 19.88, p = 0.000 (p < .05)** and solving problems χ^2 **(1, N=2040) = 8.43, p = 0.004. (p < .05).** Upon examining the table, to see which cells were creating this significance, by comparing the expected and the observed count, there are two observations; 1)

learners who enrolled in a MOOC before, were more engaged with watching videos and solving problems; and 2) learners who hadn't enrolled in a MOOC before, were less engaged with both watching videos and solving problems.

As a result of the above, I rejected the null hypothesis and accepted the alternative hypothesis: there is a relationship between previous MOOC enrollment and engaging with watching videos and solving problems.

With regards to interviewees, both I1 and I4 had previously enrolled in 2 or 3 MOOCs but had lower than average engagement. I2 had enrolled in many MOOCs before on different subjects, and is actually considering teaching a MOOC, and had a higher than average engagement. I3 had previous MOOC experience and had higher than average engagement. I5 who had never participated in MOOCs before, didn't know how to learn in a MOOC, and had lower than average engagement. However, I6 also hadn't enrolled in a MOOC before but had higher than average engagement. Finally I7 had enrolled in one MOOC previously, but also had lower than average engagement.

Variable 4: Age Group and Video Watching + Problem Solving Engagement

The question asked learners about their age group, possible responses were:

1- Less than 18 years
2- Between 18 and 25 years
3- Between 25 and 35 years
4- Between 35 and 45 years
5- Above 45 years

An association was observed between age group and level of engagement in watching videos χ^2 **(5, N=2040) = 27.99, p = 0.000** and solving problems χ^2 **(5, N=2040) = 18.34, p = 0.003. (p < .05).** Upon examining which cells that were creating this significance, by comparing the expected and observed count, it appears that learners between ages 25 and 45 were more engaged with both watching videos and solving problems, and that learners under the age of 25 were less engaged with both activities.

As a result of the above, I rejected the null hypothesis and accepted the alternative hypothesis: there is a relationship between age group of learners and their level of engagement with watching videos and solving problems.

Variable 5: Video watching engagement level and Primary Occupation

The question asked learners about their primary occupation, possible responses were:

1- I work full time
2- Contractor of Freelancer
3- I work for my private business
4- University student
5- High school student
6- Unemployed
7- Retired

An association was observed between primary occupation and level of engagement in watching videos χ^2 **(7, N=2040) = 25.52, p = 0.001** but no association was observed in solving problems χ^2 **(7, N=2040) = 12.64, p = 0.081 (p > .05)**. Upon examining which cells that were creating this significance, it appears that all occupations were engaged more in watching videos, except for university students who were less engaged with watching videos. The cells with most significant difference between the expected and observed counts were learners who are working full time or working for their private businesses.

As a result of the above, I rejected the null hypothesis and accepted the alternative hypothesis: there is a relationship between primary occupation of learners and their level of engagement with watching videos. However, I accepted the null hypothesis: there is no relationship between primary occupation of learners and engagement in solving problems.

Variable 6: Likert scale question about Achievement Sense and Video watching + Problem Solving

The question asked learners to indicate their level of agreement with the following statement:

Completing the required assignments and MOOC requirements gives me a sense of achievement. The responses were the following (arranged according to their code)

1- Strongly Disagree
2- Disagree
3- Neutral
4- Agree
5- Strong Agree

An association was observed between feeling a sense of achievement when completing MOOC requirements and level of engagement in watching videos χ^2 **(5, N=2040) = 13.85, p = 0.017** as well as solving problems χ^2 **(5, N=2040) = 15.86, p = 0.007.** Upon examining which cells that were creating this significance,

it appears that learners who strongly agree that completing the MOOC requirements and assignments gives them a sense of achievement engaged more with watching videos and solving problems.

As a result of the above, I rejected the null hypothesis and accepted the alternative hypothesis: there is a relationship between feeling a sense of achievement from completing MOOC requirements and engagement in both watching videos and solving problems.

Variables of Primary Motivation for joining the MOOC and Learning for Enjoyment of Learning.

Even though there was no statistical significance in the chi square test for these variables, the interviews showed that learners who define themselves as lifelong learners who learn for the enjoyment of learning as well as learners who had the motivation to self develop also engaged in the MOOC. Additionally, learners who self-regulate their learning and are familiar with learning in a MOOC were more engaged. Since self-regulated learning, motivation and lifelong learning were important themes in the literature, the interviews were analyzed according to these themes as well.

The question in the Pre-MOOC survey about motivation asked learners: What is your primary motivation for enrolling in the MOOC? Possible responses were: 1) to increase my chances of getting an educational or employment opportunity, 2) This MOOC is beneficial for my current job or studies, 3) for my personal information, and 4) to meet other learners with the same interests. Participants could select more than one response in this question. The chi-square test showed no association between motivation from enrolling in the MOOC and watching videos χ^2 **(15, N=2040) = 23.8, p = 0.082 (p > .05)** and no association with solving problems either χ^2 **(15, N=2040) = 11.68, p = 0.703 (p > .05).** The question in the Pre-MOOC survey about enjoyment of learning, asked them to indicate their agreement on a Likert scale with the statement: I learn for the sake of learning and enjoyment of learning.

There was no association between enjoyment of learning and watching videos χ^2 **(4, N=1975) = 2.08, p = 0.720 (p > .05)** and no association with solving problems either χ^2 **(4, N=1975) = 2.42, p = 0.659 (p > .05).**

With regards to self-motivation, I2, I3 and I6 were all determined by the analytics to have higher than average engagement. I2 said

> **"***My main motive, from the beginning is self learning, constantly. I have to learn because I teach, so I have to always learn about what's new. Also, these MOOCs give me experience in how to train, so I learn from others' expertise...So I learn from their expertise in that field and benefit from these experiences… Also, I am search oriented and I always like to learn, all the time."*

Similarly I3 mentioned, *"my sense of commitment kept me throughout the duration. I don't mind that it is boring... it was the commitment to the course, I was also receiving new information."* Also, I6 said,

> *"I like marketing. When someone likes something they will want to do it. I liked to learn this content, so had self-motivation to keep going back to the MOOC. Also, the motivation came from the videos of interviews with experts that were at the end of the weeks. This was very good. It motivates and encourages people to do marketing, you learn experience from them."*

With regards to lifelong learning, I told them to indicate whether a definition of lifelong learning applied to them and asked them to reflect on their answer. The definition I offered was "lifelong learning refers to the idea that individuals do not learn only in formal education institutions such as schools, universities and adult education institutions, but can also learn in non-formal as well as informal settings such as at work, at home and in the wider community during their lifetime from early childhood to learning in retirement." I1 (lower than average engagement) said,

> "*from some of the videos I watched, the content helped in some of the technical aspects I would need in digital marketing... how I could use marketing in social media. So this helped me collect knowledge and clarify my perspective when I am looking at the social media channels… that helped in growing my skills for my knowledge base."*

I2 indicated that this definition applies to them very much saying,

> "*I don't have a problem learning anytime, which gives me the motive to continue learning. Not just on this MOOCs, I am on Edx and Hp initiative. And I am always participating on these platforms of Elearning. I am search oriented and I always like to learn, all the time."*

I2 also touched on the importance of lifelong learning and mentioned their frustration with the fact that online courses, regardless of how beneficial they are, are not accredited in the Arab world." Additionally, I2 and I3 agreed with the

definition applying to them as well. I2 said, *"Yes, of course the definition applies to me. Even the smallest piece of information helps you...it will be useful someday on the long run. Yes, it did help me, I remember a lot of things"* and I3 said, *"yes, [the MOOC] taught me things that I would use for life."*

Self regulation

With regards to how learners self-regulated their learning, they mentioned a few of these strategies during the interview. I2 said,

> *"I would determine specific hours to work on the MOOC. So in the morning I would sit for an hour, so I could pay attention to it. If there were articles to read, I would do that in the evenings or during the day, and read about the course topics. So that throughout the day, I would be continue with the track I am on and focus on my learning."*

I2 also mentioned how they self-regulate their learning in the MOOC saying,

> *"because I am a freelancer... I have the ability to manage my time well… I have the skills of self-learning. To manage time everyday and go back to the MOOC, that's part of self-learning, the commitment and keeping up with the course. But there's also the part that has to do with skills of self learning, like reading and understating, analyzing, connecting concepts, how to come up with new ideas from what we learned or creativity in coming up with new ideas. So not everyone has that, I am from the people that spread the word... So I have a love of learning, and a love of knowledge sharing."*

I3 (higher than average engagement) also discussed their methods for self-regulation saying,

> *"I always made sure to listen to one lecture a day ... I always used to like to know, not to memorize, and not to over-study. If there is a video that I really want to remember, then I save it. Because if I pressure myself too much, it is not good, especially for online courses. I answered the problems immediately, because they weren't hard."*

I6 (higher than average engagement) mentioned how it's easy to regulate their learning in this MOOC since their university isn't too demanding. I6 said,

> *"[university] doesn't need too much so I have lots of free time to learn something new. The self- regulated learning strategies I used were that I was writing down everything the video was saying in my notebook. At the end of the week I would download all the videos and watched them all in one go and then answered the week's questions right away."*

Similarly, I7 (lower than average engagement) said, *"I self develop by reading, watching videos in the field, in the field that encourages self learning, books that*

discuss the professional and self development."

Research Question 2

What is the nature of the relationship between engagement in watching videos and solving problems, and teaching presence, social presence and cognitive presence?

Research Question 2 Hypothesis (H_2)

There is a relationship between learner engagement and the CoI presences; teaching presence, social presence and cognitive presence.

Research Question 2 Null Hypothesis (H_{o2}) (for Chi square test purposes)

There is no relationship between the learner's level of engagement in watching videos and solving problems, and each of teaching presence, social presence and cognitive presence.

The research hypothesis aims to explain what the direction of the research study is, however in order to conduct a statistical test, we test the null hypothesis as it's not possible to test a directional hypothesis with a statistical analysis.

I failed to reject the null hypothesis, in other words there was no significant relationship between video engagement or problem solving and each of the presences.

This section includes the presentation of the results of the SPSS Chi Square test to explore the relationship between each of video watching and problem solving, and the three presences of the Community of Inquiry framework (teaching presence, social presence and cognitive presence). I've included all the cases below, none of which were statistically significant (Asymptotic significance less than 0.05). Additionally, the interviews were thematically analyzed based on the three CoI presences, so I've included the interview responses relevant to each CoI presence below, along with the Chi-square test results.

The formula for chi square test association will be included next to each variable according to the chi square test reporting formula: **Pearson Chi Square χ^2 (degree of freedom, Number of sample) = Pearson chi square value, statistical significance ($p < .05$).**

I failed to reject the null hypothesis, indicating that there was no significant relationship between either of my two measures of engagement and each of the CoI presences. However, that does not mean that there isn't a relationship between these variables, it simply means that the way of measuring that relationship through

watching videos and solving problems may not be the most accurate way to do so.

Variable 1: Perception of Teaching presence and level of video engagement + level of solving problems engagement

There were 12 questions in the teaching presence category that asked learners about their perception of the teaching presence in the MOOC. These were all likert scale questions asking learners to indicate their level of agreement to the following statements.

Design & Organization

1. The instructor clearly communicated important course topics.
2. The instructor clearly communicated important course goals.
3. The instructor provided clear instructions on how to participate in course learning activities.
4. The instructor clearly communicated important due dates/time frames for learning activities.

Facilitation

5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.
7. The instructor helped to keep course participants engaged and participating in productive dialogue.
8. The instructor helped keep the course participants on task in a way that helped me to learn.
9. The instructor encouraged course participants to explore new concepts in this course.
10. Instructor actions reinforced the development of a sense of community among course participants.

Direct Instruction

11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.
12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.
13. The instructor provided feedback in a timely fashion.

The responses were the following (arranged according to their code)

1- Strongly Disagree
2- Disagree
3- Neutral
4- Agree
5- Strongly Agree

No association was observed between perception of teaching presence and engagement with watching videos χ^2 **(1, N=126) = 1.44, p = 0.229** and problem solving χ^2 **(1, N=126) = .27, p = 0.602**. **(p > .05)**. As a result of the above, I failed to reject the null hypothesis that there is no relationship between engagement in watching videos and solving problems, and teaching presence.

With regards to the interviewee responses related to level of engagement and their perceptions of teaching presence, there were varied responses. The majority thought the organization of the content was good, but would have appreciated more interaction with the teacher. I1 (lower than average engagement) said that,

> *"the instruction/explanation style was very good… The course organization was great, in that it started with the introduction…[of] the theoretical part...Then it started going into more practical things, which is what I needed…I would participate if there is something I don't understand so I ask the professor, if someone else asks it that's enough for me. That's why I usually don't ask questions or interact on the discussion boards on MOOCs."*

Similarly, I2 (higher than average engagement) appreciated the organization and management of the MOOC saying, "*the MOOC was great, regarding both management of the MOOC and the instructor as well, she was great and well experienced in the field."* But I2 mentioned a limitation to the interaction of the teacher saying,

> "[*o]ne of the limitations for the Edraak platform is the issue of feedback… it is not perfect yet, so it needs more improvement. But they are trying because they have discussion forums for conducting discussions for the participants. And this is effective, but there isn't that much commitment from my side honestly, because I don't enter all the discussion posts that happen."*

I3 (higher than average engagement) also perceived that the teaching presence could have been better saying,

> *"I can't decide on the feedback because I didn't visit the forum. The course itself was… I can't find the word. In other courses, they make it interesting. In this course, it was merely relaying information, but not interesting and fun…I had the least engagement, because the instructor didn't imply that there should be a discussion. I'd also appreciate if she is more creative, using different techniques, to have more visual queues."*

I5 and I7 (both lower than average engagement) also mentioned how the

interaction wasn't a lot and would have appreciated more interaction. I5 said, "*Discussions have lots of advantages. Instructors have to interact with students"* and I7 said,

> "*The interaction between the learners and the instructor was medium... maybe the thing that made it not so good is the diversity in opinions of learners. Everyone is from a different country; there are differences in preferences. So maybe that's the reason for the lack of interaction, but the content itself was good."*

I7's recommendation to make the MOOC more interactive touched on how it would be good for the instructor as well as the content to be relatable and inclusive for all learners saying,

> *"I didn't interact much with the MOOC. But I have a personal reflection. So that the interaction is more, is that the presented content should be in the domain of every sector of the society, so that the interaction is more and so that it attracts participants more…I mean for people with different skill and educational levels... because there are some people who are very familiar with this field, and there are people who are medium and ones who don't know anything about the field. So this would increase the interaction and participation."*

Variable 2: Perception of Social presence and level of video engagement + level of solving problems engagement

There were 9 questions in the social presence category that asked learners about their perception of the social presence in the MOOC. These were all likert scale questions asking learners to indicate their level of agreement to the following statements.

Affective expression
14. Getting to know other course participants gave me a sense of belonging in the course.
15. I was able to form distinct impressions of some course participants.
16. Online or web-based communication is an excellent medium for social interaction.
Open communication
17. I felt comfortable conversing through the online medium.
18. I felt comfortable participating in the course discussions.
19. I felt comfortable interacting with other course participants.
Group cohesion
20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.
21. I felt that my point of view was acknowledged by other course participants.
22. Online discussions help me to develop a sense of collaboration.
The responses were the following (arranged according to their code)

1- Strongly Disagree
2- Disagree
3- Neutral
4- Agree
5- Strongly Agree

No association was observed between perception of social presence and engagement with watching videos χ^2 **(1, N=126) = 1.98, p = 0.159** and problem solving χ^2 **(1, N=126) = .816, p = 0.366**. **(p > .05)**. As a result of the above, I failed to reject the null hypothesis that there is no relationship between engagement with watching videos and solving problems, and perception of social presence.

With regards to interviewee responses related to their engagement and perception of social presence, the majority of feedback was that they weren't joining the MOOC to socialize with other learners, but would have appreciated more social interaction and discussions with participants.

I1 (lower than average engagement) said,

> "*Most of the courses I am engaged in the videos and the text, but not all the courses I enroll in I interact with other participants or the discussions. I focus on the videos and to solve the tasks that are required from the instructor… For me, even in other websites, I prefer to read the discussion rather than participate."*

When asked about how beneficial interacting with others in the course is, I1 said,

> *"of course it's useful for me to know whoever is moving in the same track as me, what they reached and how they reached it...These stories make a difference in all fields, and it's important for me to know them through participants in the course and people working in the field even if they aren't participants or learners in the MOOC. This helps us answer questions we wonder about how to succeed in these fields."*

I2 (higher than average engagement) mentioned that the social participation is an area that the MOOC should be improved in saying,

> "*[Edraak course developers should] think about communication methods that would be more effective in integrating the participants in the learning and training process. Such as sending them assignments to do or discuss before, or apply some of the concepts from them, and this would be required. So they would assign a grade for them in the MOOC. You see, what happens is that you get the grades when you answer the quiz that is at the end of the week, but there are no grades for participation. So to make participants more engaged in the conversations and discussions, I would suggest having some of the MOOC grades on these discussions... if there are no grades on the discussions or the participation... [Interaction] has a positive effect on the learning experience because it makes the participants take part and become involved in these courses."*

I3 (higher than average engagement) and I5 (lower than average engagement) also had a similar comments about the technical aspect of the discussion forums. I3 said, "*I already told them that, the platform of the discussion board is not user*

friendly, it's 'laggy', hard to keep up with, so I don't use the forum that much…I didn't feel that I needed to participate, or compelled to go to the forum" and I5 said, *"The forum is confusing. Sometimes I feel lost. Once I click, I don't know what follows. Moreover, after watching the video, I have to go to another page to suggest a comment. It would have been better to make it on the same page... although I was very interested and enthusiastic at the very beginning."* Finally, I6 (higher than average engagement) didn't feel interested in participating in the discussions saying, "*I didn't connect with anyone at all. I just downloaded videos, watched them, solved the problems weekly and that's it."*

Variable 3: Perception of cognitive presence and level of video engagement + level of solving problems engagement

There were 13 questions in the cognitive presence category that asked learners about their perception of the cognitive presence in the MOOC. These were all likert scale questions asking learners to indicate their level of agreement to the following statements.

Triggering event
23. Problems posed increased my interest in course issues.
24. Course activities piqued my curiosity.
25. I felt motivated to explore content related questions.
Exploration
26. I utilized a variety of information sources to explore problems posed in this course.
27. Brainstorming and finding relevant information helped me resolve content related questions.
28. Online discussions were valuable in helping me appreciate different perspectives.
Integration
29. Combining new information helped me answer questions raised in course activities.
30. *Learning activities helped me construct explanations/solutions.*
31. Reflection on course content and discussions helped me understand

fundamental concepts in this class.
Resolution
32. I can describe ways to test and apply the knowledge created in this course.
33. I have developed solutions to course problems that can be applied in practice.
34. I can apply the knowledge created in this course to my work or other non-class related activities.
The responses were the following (arranged according to their code)

1- Strongly Disagree
2- Disagree
3- Neutral
4- Agree
5- Strongly Agree

No association was observed between perception of cognitive presence and engagement with watching videos χ^2 **(1, N=126) = 2.53, p = 0.111** and problem χ^2 **(1, N=126) = 1.04, p = 0.307**. **(p > .05)**. As a result, I failed to reject the null hypothesis that there is no relationship between engagement of watching videos and solving problems, and perception of cognitive presence.

With regards to the interviewees' feedback in relation to their engagement and perception of cognitive presence, the majority of the learners interviewed really benefited from the content offered in the MOOC and thought they could apply what they learned in the MOOC to their professional and personal lives outside of the course. Additionally, many interviewees found the topics interesting, stimulating and the problems in the quizzes were challenging and perceived that as a positive thing. I1 (lower than average engagement) said,

> *"The course organization was great… it started with the theoretical part...Then it started going into more practical things, which is what I needed... I focuss[ed] on the videos and to solve the tasks that are required from the instructor… and after I solve the questions, I check which I got right and which were wrong."*

I2 mentioned a suggestion that would keep learners more engaged with the videos, "*The suggestion is to add some questions in the middle of the video, so that the learners are attentive with the content. It's good to have a test at the end of the video, but it would grab the learners' attention during watching the video."* Similarly I2 (higher than average engagement) learned from the content of the MOOC as well as how the MOOC was presented, which helped in their profession. I2 said,

> "*regarding the production of the MOOC, either the videos or the case studies, or the questions that were at the end of the MOOC, I benefited a lot... I am in the field where I will begin to apply these concepts, so I had a consultation, which asked me to do a web marketing strategy, so I used the items that I learned in this MOOC ... So this was the first application. But for me as well, I prefer that as an educator and strategy consultant, I'd like to use these social media platforms as well…I also gain in another way through MOOCs, the strategies they use, the methods they use to present the subject, the sequence of the subject and how they presented it, the videos they make, the questions they give the learners. So my benefit is much more than any normal person, because I have experience in the field of training, and it's important for me to develop in my field."*

I3 (higher than average engagement) benefited from the MOOC, however thought that the MOOC should have given more advanced content and should have been more engaging saying,

> "*It was good, but not detailed. So, it was a good general introduction, but it wasn't really advanced enough… It could have had things that had to do with the practical knowledge and not only the theoretical part. I appreciate that she added the interviews at the end of each week. Even though, they were a bit too long, and very dull. I think that if she did it more in a fun way, it would have made it more interesting… It was not very intriguing, mostly it was general knowledge; it didn't add much knowledge to [me]… but I noticed that in the quiz, the questions were designed to have very specific answers from the videos that she gave, even the options she gave were very close to one another, so you have to be accurate, it was challenging and this was a good thing…Certainly it added knowledge to me that I could use, as a starting point. I appreciate it regardless of my criticism."*

Similarly, I4 (lower than average engagement) mentioned the same recommendation, even though I4 was neither visiting the MOOC videos nor answering the problems, they had a general recommendation saying, *"Things that would help learners be more engaged is to add more livelihood, more practical examples, including illustrations."* Moreover, I6 (higher than average engagement) mentioned that the content was very beneficial saying,

> "*It was organized; the content was sequential from the start... Honestly the MOOC is good but one needs to self develop. But the MOOC itself is good…it taught me things that I would use for my life… I watched all the videos. But on the app not on the website. I download the videos and watched them all in one go at the end of the week, then solved the problems right away for that week… I didn't connect with anyone at all. I just downloaded videos,*

watched them, solved the problems weekly and that's it, so that I could benefit. It was very beneficial. There were some questions that were difficult, but that's good."

On the other hand, I5 (lower than average engagement) was confused by the MOOC platform, so this lead to disengagement, but would have also appreciated more information and content. I5 said,

"I watched only one video on the MOOC introduction. I lost interest because of the confusion. From the video I saw, there were many theoretical parts without the practical side. If there were more implementation, that would be more interesting… I gained little experience, not only from the videos, but other reading material on E-marketing, because I am interested to learn more about it. So, I wanted to have a preliminary knowledge about it, but I couldn't deal with the MOOC platform."

Similarly, I7 (lower than average engagement) thought that content was well organized but didn't benefit from it much saying, "*I watched some of the videos, but not everything; around 6 or 7 videos but I didn't try to solve the problems. The way the content was placed and organized, in my opinion was good… I learned new information but I didn't apply it in my professional life."*

Finally, I also asked the interviewees to reflect on their own level of engagement and on what were the factors, both design-related and personal, that lead to their engagement or disengagement. There were some interesting insights from the responses to this question, I2 mainly attributed their own self-motivation to learn, which was mentioned in relation to the variable on self-motivation, but discussed how the advantages of MOOCs being open and free as the reason saying,

"of course the factors are many… this is a new form of learning… learning anywhere and anytime. I am not committed to a specific time or place for the training. The second thing is that I don't pay; on the contrary this MOOC is free of charge. The additional advantage is that they also give you a certificate of participation, that you took this course and received the grades."

I3 attributed their sense of commitment as the reason for coming back to the course, and also learning new information, but interestingly I3 who had higher than average engagement (as determined by the learning analytics) and received the MOOC certificate, mentioned that their own perception of their engagement was not high at all. I3 said,

"For this course I had zero participation. But in general, I was

> *watching the video, solving the problems and received the certificate. I had the least engagement in this course, because the instructor didn't imply that there should be a discussion... the way the content was presented was also not intriguing… In another MOOC that I am taking, the presentation of the content is very interesting and intriguing so I am more engaged with that course than this one. Other than that, there are none* [referring to factors to stay engaged]*...my sense of commitment is what kept me going back to the course, even if I am not enjoying it... I don't mind that it is boring. About me, it was the commitment, about the course, I was receiving new information, like the elements, tools, how to manage your account. So, there was information coming in."*

Regarding perception of engagement and reasons for disengagement, I1 attributed both personal factors as well as design-related factors that had an effect on his engagement saying,

> "*I was mostly involved in the first week, this is when I was committed to watch the videos about the social media marketing, communication rules…etc., then after that I had a course so I couldn't continue the MOOC and watch the videos or try the problems…Regarding this MOOC specifically, what made me not continue is that I got busy at work, and because I am taking another course. So this made it difficult for me to continue to participate in the MOOC."*

I1 had a suggestion of adding quiz questions in the middle of videos to keep learners attentive and engaged. Another technical suggestion I1 mentioned was how beneficial it would be for learners to have a progress bar or check marks that appear next to the MOOC activities they complete, so that when they return to the platform they would pick up from where they left off the previous time. Similarly, I4 and I7 (both lower than average engagement) mentioned how their work commitments and other issues in life hindered their participation in the MOOC, which are personal factors, and I7 mentioned also design factors saying, "*the videos weren't offering something to attract my attention."* Finally, I5 (lower than average engagement) attributed design-related factors and lack of knowing how to learn in the MOOC as the reason for disengagement saying,

> *"All I know is that it was about uploaded videos. Maybe I didn't get it right. I don't know how to deal with it. MOOC timings of posting videos are also unspecified. Sometimes, I receive links in the email that have passed the due date. At that point, I feel lost, and don't know whom to ask."*

For I5's reflection, I was reminded of Andragogy and Heutagogy, and that not every adult learner is in fact independent; some adult learners prefer to

be directed towards the outcomes rather than define their own outcomes themselves. This heavily relates also to the idea that enrolling in previous MOOCs before gives learners experience in *how* to actually learn in such courses, since they are different from other types of courses they need orientations and guidance for learners who require that to have a successful learning experience. Although the was actually a section on the course platform that outlined the course organization and structure, as well as included guiding points on how to learn in the MOOC.

As has been presented above, the data from the chi square test was informative in understanding whether there were statistically significant relationships between some of the variables and engagement levels. It was also interesting to hear the interviewee's reflections and opinions, which were all insightful in different ways. Not only did they mention their experiences in the course, but they also offered some recommendations, both for the platform and for the design of the course. The results, reflections and comments that emerged in this research study all relate to concepts outlined in the literature, and thus in the following section I offer the discussion of the results in relation to the literature as well as the implications for this study, and interpretations of this data.

Chapter V: Discussion, Conclusions, Limitations, and Future Research

This chapter discusses and interprets previously presented results, and establishes their relevance to foundational literature and additional supporting research.

Discussion of Results for Research Question 1

With regards to the first research question, which was concerned with understanding if there is a relationship between engagement (watching videos and solving problems) and some variables pertaining to learners' profiles as well as aspects about their goals, motivations, knowledge about the subject, there were both anticipated observations, as well as some interesting findings and insights.

It appears that the learners who joined the MOOC with the goal of receiving the certificate, engaged more with watching videos and solving problems, thus they worked towards that goal through completing the requirements outlined in the course description to grant them the certificate (receiving 70% score on the quizzes). This was also echoed in the statistically significant relationship between engagement and certificate eligibility, showing that learners who were eligible for the certificate were ones that had engaged in both watching videos and solving problems. However, interestingly learners who enrolled in the MOOC with the goal of learning about the E-Marketing field, *without* necessarily committing to obtaining the certificate, engaged more with watching the videos and less with solving the quiz problems. This, in general terms, makes sense because if the learners' goals are only to gather information and knowledge about the field, they would primarily pay attention to learning the content, rather than be motivated to conduct the assessments that would lead to them obtaining the certificate (solving problems). In more specific terms, this relates to multiple notions mentioned in the literature; learners enrolling in MOOCs for lifelong learning (Yuan & Powell, 2013; Bozkurt & Aydin, 2015), MOOC enrollment for professional development (Littlejohn et al., 2016), and that learners join MOOCs to learn about the topics they find interesting and decide on what their level of engagement with the MOOC is going to be, which means that the success of a MOOC should not be measured by number of learners who receive the course completion certificate (Clark, 2013). This was further mirrored in the interviews as most of the interviewees mentioned how they were interested in gaining the skills

taught in the MOOC for potentially applying them in their professional lives (both in the E-Marketing or social media field and in the training and E-learning field), gaining experience and learning about the field in general, which to them was more meaningful than receiving the certificate of completion. This is echoed in the literature about the importance of MOOCs for professional development and how many learners now enroll in them for that purpose (Littlejohn et al., 2016).

With regards to age groups of learners and the relationship of that variable to engagement, it appears that learners between ages 25 and 45 were more engaged in both watching videos and solving problems. This also resonated with another relevant variable's significance; learners' primary occupations. The learners who were either working full time or have a private business were the ones who were most engaged with watching videos, which not only resonates with the idea of professional development as well, but also reinforces the significant relationship in the age group variable, since usually individuals between ages 25 and 45 are ones who are in either of those occupations. However, there was no relationship between occupations and solving problems, further reverberating the fact that learners are joining to learn the content and gain experience for their jobs or to grow their private businesses, rather than solve problems in order to prove they have learned the knowledge though gaining a certificate.

Further, the fact that there was statistical significance between knowledge about the MOOC subject and higher engagement, could also mean that learners enroll in MOOCs for professional development purposes, because those learners that were more engaged with both watching videos and solving problems were the ones that either had work experience in the field, already had a higher education certificate in the field, or read a lot about the field in general. Two of the interviewees were working in the field of Marketing, one of whom was doing a postgraduate degree in the field, and other interviewees who were also highly engaged were also interested in the field in order to have their own business and thus be able to market it online. The learners who were shown not to engage with either the videos or the problems were the ones who didn't have any knowledge about the field. This resonated with what the instructor mentioned in the interview, that learners often asked her about the meaning of certain terminology, for example what a 'hashtag' means, so these learners could be

potentially not cognitively engaged with the content that is presented in the MOOC as a result of not being familiar with the field at all.

Moreover, learners who had been enrolled previously in MOOCs were shown to be more engaged in this MOOC both in watching videos as well as solving problems, while the learners who didn't have previous experience learning in MOOCs were shown to be less engaged in both activities. This resonates strongly with the idea that it's important to learn *how* to learn in MOOCs, in addition to *what* to learn. Jesse Stommel, who in partnership with Sean Michael Morris, ran a MOOC called MOOCMOOC, which was a MOOC about MOOCs and how learning occurs in such courses. Stommel (2012) argued, in the original announcement about the MOOC, that

> "Content and learning are two separate things, often at odds with one another… Most content is finite and contained; whereas, learning is chaotic and indeterminate. It's relatively easy to create technological infrastructures to deliver content, harder to build relationships and learning communities to help mediate, inflect, and disrupt that content" (Stommel, 2012).

Stommel & Morris (2013) also maintain that instruction does not automatically lead to learning, since learning cannot be guaranteed by a certain approach or methodology. They elaborate saying that pedagogical praxis create certain roads where learning may take place, but assessment is a checkpoint along that road to look into how the tools used and the learners are cooperating with one another. This indicates that assessment doesn't measure learning, but rather measures the design of the instruction (Stommel & Morris, 2013). Learning in MOOCs requires the learner to have the skill of self-regulation of learning, determining tasks or setting goals to fulfill and working towards them with or without instruction from the instructor, being intrinsically driven to learn the content for gaining knowledge and be familiar with how to learn in MOOCs, since this is a new way of learning that wasn't quite popular during the years that most of these learners were in school or university (age group mostly between 25 and 45). In fact, the interviewee who had the most experience in terms of enrolling in many MOOCs before, portrayed the strongest signs of self-regulated learning, both verbally and as I also gleaned from the conversation. I2 not only plans to continue enrolling in many MOOCs to self develop, but also mentioned the fact that they are considering actually teaching a MOOC, which I don't believe is an aspiration people who aren't very familiar with MOOCs and how they are run have. I2 not only

mentioned that they define self-regulation as not only having aspects to do with managing time and studying, but also with synthesizing information, making connections between concepts learned, searching for information and constantly looking for new ideas and ways to be creative with that content. Additionally I7, who had never enrolled in a MOOC before this one, attributed the lack of knowledge of how to deal with the MOOC or the platform as the main reason for their disengagement, which further explains the statistically significant relationship outlined by the chi-square test results.

Finally, even though there was no statistical significance observed between primary motivation from joining the MOOC and engagement levels, it appeared from the interviews that learners who were intrinsically motivated to learn the content engaged more with watching videos and solving problems. The interviewees also didn't mention interacting with other participants as one of the main motivations; as aforementioned they were more interested in learning the content only. Additionally, there was a statistical significance observed between learners' engagement in both watching videos and solving problems and their agreement to the statement 'in the absence of the instructor, I self-motivate and praise myself on the work I do well.' This therefore echoes the notions from the literature about the importance for self-motivation and self-directed learning of adult learners (Knowles, 1975; Littlejohn et al., 2016; Zimmerman, 2000). With regards to motivation for learners to enroll and engage in MOOCs, it was shown that learner motivations vary and there was no statistical significance between motivation and engagement. However, the Pre-MOOC survey categorized motivation in four areas; increasing chances of getting an educational or professional opportunity, benefiting current job or studies, personal information and meeting other learners with the same interests. Research conducted at Duke University by Belanger and Thornton (2013) have categorized learner motivation to typically fall in the following four categories;

> "to support lifelong learning or gain an understanding of the subject matter, with no particular expectations for completion of achievement; for fun, entertainment, social experience and intellectual stimulation; convenience, often in conjunction with barriers to traditional education options; and to experience or explore online education" (as cited in Yuan & Powell, 2013, p. 9).

Thus the question about primary motivation did not include these factors; some were

included in the question about the goal of joining the MOOC and others were included in this question. So it seems that the Pre-MOOCs classification of motivation could have been clearer. Moreover, there was a statistical significance observed between feeling a sense of achievement upon completing the course requirements and engagement, which also relates to the idea that learners engage in MOOCs to the extent they decide and that their engagement highly depends on their own motivation.

Discussion of Results for Research Question 2

With regards to the second research question that explored the relationship between engagement and the CoI presences, it appears that there was no statistical significance observed with any of the presences. This could be interpreted in a myriad of ways. This research did not venture to find out the reasons for the lack of significance of the relationship between these variables, but rather whether that relationship existed or not, and if so what were the observed behaviors that had that effect on the chi-square test. There are few important points to make about these results. The first is that measuring engagement through the learning analytics numbers of watching videos and solving problems might not be the most appropriate way to measure cognitive engagement in a MOOC. This is elaborated on in the limitations section, however it seems that these numbers were not very explanatory about the level of learners' engagement in the MOOC, which is why the decision to include interviews was made; in order to gain a deeper understanding of what the learners themselves perceive as their engagement level and the reason they attribute their engagement or disengagement to. One of the interviewees (I3) mentioned that her perception of her engagement was very low, but she remained committed to finish the MOOC as a result of her commitment; however, the learning analytics showed I3 as higher than average engagement. This was one instance in the interviews, while the other learners perceived their engagement level the same way the learning analytics showed them to be. However, I3's reflections related to a study in the literature about this. The study defined cognitive engagement as pausing in lecture videos, versus the behavioral engagement of watching lectures videos, the authors found that a large percentage of the learners that were behaviorally engaged (watching video lectures) were not cognitively engaged (almost never pausing videos or paused videos fewer times as the course progressed). They state that this could be an indication that being

behaviorally engaged in MOOCs does not necessarily mean being cognitively engaged (Li & Baker, 2013). This relates to the finding of my study in that simply watching videos may not be the most appropriate measure for learner engagement in MOOCs. This is magnified by the fact that the platform does not collect detailed information about the level or type of engagement in watching videos; the analytics simply show if a learner *visited* the video rather than actually watched it, which I discovered when I searched for my own analytics in the dataset and found that it recorded 8 instances of videos watched, whereas I had only watched two videos in full and simply visited the rest of the videos briefly. The analytics themselves indicate 'number of videos visited' instead of any other information about engagement with videos, which makes it problematic to map out the learners who actually watched the videos versus those who simply clicked on the video for a few seconds. This issue of not knowing the level of engagement accurately was somehow made up for, as I defined engagement as both watching videos and solving problems, rather than one of these activities on its own. However, not all learners who were highly engaged in watching videos were also highly engaged in solving problems, and vice versa, and both of these variables were associated with other independent variables about learners, as aforementioned, such as age group, goals from joining the MOOC, motivation for enrolling in the MOOC, self-motivating and self-regulating.

Additionally, the CoI model maintains that for a successful online learning experience to occur, the combination of all three presences needs to take place (Garrison et al., 2000). Especially important is social presence because it helps learners establish trust and accordingly comfortably engage with others in order for social knowledge construction to occur (Garrison et al., 2000). This particular MOOC did not intentionally aim to socially engage learners in a social learning community, as indicated by the instructor and according to my observation of the MOOC, and thus there was a missed opportunity for social presence to manifest. The discussion forums weren't integrated in the pedagogical design of the MOOC and were simply used for learners to ask questions, most of which were technical in nature but there were also some content-related questions. According to the instructor, the first two iterations of the MOOC had learners who not only frequently asked content-related questions but also would ask the instructor for feedback about their E-marketing projects at work,

and the instructor said that checking the discussion board five times a day often wasn't enough and she needed help from her TA in that regard. The majority of the interviewees also mentioned the weak social presence in the MOOC in that they didn't feel the need to interact with others on the discussion forums, or even visit the forum in the first place. They also recommended that the instructor should integrate an interactive, participatory and social discussion aspect in the MOOC design for learners to be more engaged.

Moreover, The English CoI instrument used for this study has been validated, however I translated the CoI instrument to Arabic in order to send it to the learners, since the MOOC itself was in Arabic. The translation of the instrument hasn't been validated however, so the lack of significance in the results might be attributed to the possibility of the translated survey not being explanatory or descriptive enough for learners to fully grasp the meaning of the statements asked. Also, the Arab world is very different from the US in terms of culture, educational systems and structures, and more importantly degree of experience in the field of online learning and MOOCs. So it could be that the CoI instrument itself needs to be contextualized to the region's learner profiles and backgrounds, which is a function of the validation of the instrument that needs to occur. This is a recommendation for future research surely, but it's important to be mentioned, as it could be one of the reasons for the lack of significance in the results.

With regards to learning analytics, they have started and been developed mostly in relation to formal education contexts (Clow, 2013). Additionally, learning analytics are most effective when they are integrated into a whole system of learner support, which is hard to achieve in MOOCs (Clow, 2013). It is even more challenging to apply learning analytics to cMOOCs in particular as a result of their emergent, fragmented and diverse nature (Clow, 2013). Learning analytics have been shown to have many possibilities for enhancing teaching and learning practices generally, and for assessment specifically (Coffrin et. al, 2014; Prinsloo & Slade, 2013; Siemens, Dawson & Gašević, 2015). When assessment is computer-based and delivered, every interaction by the learners with the environment may be recorded as process data (Ramalingam & Adams, 2011). This data can not only offer insights into whether or not students answer certain questions, but also how students go about their

assessment as well as how they interact with the environment in general such as which pages they visit…. etc., which is often referred to as navigation behavior (Ramalingam & Adams, 2011). However, an important aspect to consider with learning analytics is how these analytics will be analyzed. It is imperative to have a plan for analysis of this data because without a detailed outline of what this data will mean and how it will be interpreted, it is unlikely that these large amounts of data will lead to useful outcomes (Ramalingam & Adams, 2011). In addition, Ebner and Khalil (2016) concluded that extrinsic factors are not enough to make students committed to the MOOC; intrinsic factors are imperative as well. Of course engagement, because it has to do with motivation and self-directed learning, could differ from one learner to another and from one MOOC to another, but it seems that there might be potential through research on wider samples of MOOCs and learners, to develop a framework for engaging learners in MOOCs. In fact, this research study has been insightful in highlighting variables that are highly relevant to engagement, as well as how much motivation and self-regulation can play a role in learners' engagement in MOOCs.

Limitations of Study

1- Learning analytics not an indication for engagement

The learning analytics for videos are not indicative of whether the learners watched the videos or not, because the analytics recorded an instance of video watching when the video was *visited*, rather than *watched* in some or in whole. This means that if a video was clicked, even for a couple of seconds, the analytics recorded a 'yes' for that video being watched. This of course limits the interpretation of this type of engagement greatly, because there is no way of knowing from the analytics whether the learner merely visited the video briefly or watched the whole video. We could potentially connect this with whether they solved the problems correctly or not, however some learners with experience in the field are able to solve these problems without watching the videos, so the analytics themselves need to offer richer and more detailed data.

2- Platform incapability to collect data from Mobile app

The platform not collecting learning analytics from learners who engage in watching the videos through the Edraak mobile app. This was observed when two of the interviewees mentioned they watched the videos, but the learning analytics didn't indicate any video activity for these particular learners. Edraak's Head of Research, Dr. Sherif Halawa, further confirmed this drawback in the technological infrastructure of collecting the learning analytics.

3- Survey responses from learners who don't have any learning analytics

There were many learners who responded to the CoI survey, even though they don't have any learning analytics recorded. This of course is not indicative of *all* learners' perceptions of CoI presences in the MOOC, because some are responding to the survey without having engaged in the MOOC at all, so these learners' responses were removed from the data sets in order not to affect the statistical significance and provide meaningless results due to an inability to connect each specific learner's engagement with their perceptions of the presences. After considering the previous point, some learners could have indeed been watching the videos but on the app, so were not showing in the analytics dataset.

4- Lack of variation in survey responses

For the learners who did respond to the CoI survey, the majority of their responses were 'agree' or 'strongly agree', without much variation in the results. Therefore, there isn't that much we could infer from this data and it becomes limiting, because if people aren't giving varied indications, it might be an indication that they don't have strong perceptions of all these presences, which doesn't reflect in the fact that the social presence in the MOOC was clearly weak as indicated by the interviewees and my own observation of the discussion forums.

5- Learning analytics are not indicative of learning, rather only shows behavioral patterns

Because generally learning analytics can't explain learning, but rather only show some behavioral patterns of learners on the MOOC platform, the interpretation cannot go beyond showing which were the learners who engaged more with videos and with solving problems. In other words, the interpretation cannot offer potential reasons for the behaviors that were causing the statistically significant relationships; only through interviews or deeper content analysis can we reach the level of making such interpretations, which of course would be very valuable for the study of what affects learner engagement.

6- Lack of learners' willingness to participate in interviews, and lack of sufficient time to reach out to more

It was not possible to conduct more than 7 interviews because there were a small number of learners who responded to the email asking to schedule appointments for the interview, and of those who responded only 7 were committed to the appointments scheduled to conduct the interviews.

7- Effect of removing data, and missing data from datasets

The missing data, which was removed for the analysis, could have affected the outcomes of the SPSS test. Also, the discussion board posts and responses were removed from indicating engagement, because the numbers of posts were very low, compared to the video watching and problem solving numbers. This was also because most of the discussion board questions were technical; about when the certificate would be issued, when the videos for certain weeks would be posted…etc. Thus there was no content analysis conducted on the discussion board posts and responses.

8- Limited literature and documentation about MOOCs in the Arab world.

There is very limited literature and documentation about MOOCs in general with all their topics and MOOC platforms in the Arab World. So data about MOOC platforms, numbers of learners, numbers of MOOCs provided was difficult to obtain, and there was some information that I was unable to obtain altogether.

Conclusions

This research aimed to explore the nature of the relationship between learner engagement and both the CoI presences and variables relating to the learners such as goals, motivations, age group, primary occupation, among others, using a mixed methods approach applied on a MOOC in the Arab world as a case study. The results of this research, in answering the first research question, showed that there is statistically significant relationship between engagement in watching videos and solving problems and goals of course completion, certificate eligibility, age group, primary occupation, knowledge about the MOOC subject, sense of achievement upon completing course requirements and self-motivating in the absence of instructor feedback. In answering the second research question pertaining to the relationship between engagement and learners' perceptions of the three CoI presences, this research study showed that there is no statistical significance between these variables. However, interviewee responses qualitatively enriched the study through their reflections and recommendations. The interviewees perceived that the teaching presence was strong in relation to the course design and organization, but weak in interaction with learners. So MOOC instructors need to be mindful of and intentionally aim to address the learners' need to interact with, receive feedback from and discuss the course content with the instructor. Social presence was reported by the interviewees to be weak. As shown in the literature and confirmed by this study, feeling part of a learning community and interacting with others in the course is imperative for an engaging and successful MOOC experience. Teachers should consider intentionally designing activities to fulfill that purpose, especially in xMOOCs since cMOOCs are primarily based on social construction of knowledge. One interviewee actually reflected on how difficult that process is in general saying that if one is not compelled to discuss or interact with others, chances are they would stay in their comfort zone and only do what they are required to do, or simply fulfill the goals they had when they joined the MOOC. So I2 suggested that there should be grade marks associated with discussions as that would both compel learners to engage with one another, and have an overall positive effect on their learning process in the MOOC. As much as I agree with that statement and would recommend that instructors intentionally include a strong social component in the MOOC design, I would also say

that it depends on the intended purpose or outcomes of the course itself. This idea is clearly very prominent in cMOOCs where the focus is on connected learning and knowledge construction through networked interactions. But granted, even xMOOCs, which have the intention of only delivering information in a one-way manner to learners, would greatly benefit from adding a social component in the design, at least for learners that are sociable by nature and learn better by feeling part of a community. I for one didn't know that this is my preferred learning style in MOOCs until I experienced it myself and felt how empowering this is and has the potential to be. There are a few examples of MOOCs that were able to successfully include a social constructivist and interaction component in the design and implementation of the course, without necessarily specifically being cMOOCs. One example is the *Design Thinking MOOC* by NovoEd, in which I was a participant, which recommended that learners join the MOOC in groups onsite because the MOOC was project-based where learners were guided to complete weekly parts or milestones of their project, upon which they would receive the course certification. The course designers also included a discussion board as well as a group communication tool in the platform for learners, who didn't have onsite learners to form groups with, to form groups with other course participants online. This MOOC heavily depended on the social construction of knowledge and also had strong cognitive presence as a result of the content itself being engaging, challenging, interesting and applicable to one's context. Furthermore, I found clear, strong and intentional teaching presence in the MOOC because the facilitators acted as guides both through the resources and prompts they shared with learners, but also on the discussion forums by asking about the groups' progress and offering support when needed.

Another example of a MOOC that used social constructivist elements and had both strong teaching and social presence was a MOOC titled *E-learning and Digital Cultures (#EDCMOOC)*, which was facilitated and reported on in an article by Ross, Sinclair, Knox, Bayne and Macleod (2014). This MOOC in particular does not identify as either an xMOOC or a cMOOC because its design and delivery do not simply identify with either one, but rather it "draws its approach from the commitments, experiences, and expertise of its teachers" (Ross et al., 2014, p. 63). The facilitators curated many online resources for learners to choose from depending

on the week's topic and asked learners to interact with the material and other learners, based on prompts from the facilitators, through the Coursera discussion forums, blogging, tweeting, or commenting on digital artefacts created by the MOOC teaching assistants (Ross et al., 2014). The facilitators recruited community teaching assistants to help build this social, interactive and enriching learning experience, and the facilitators would also conduct synchronous Google Hangouts sessions to respond to current discussions and contributions from the learners (Ross et al., 2014). As for assessment, learners were asked to create a multimodal, web-based digital artifact and to assess three peer artifacts; both activities were considered participation that would result in a passing grade and a "statement of accomplishment" for the MOOC (Ross et al., 2014). Additionally, "[a] distinction for the MOOC could be earned if the peer feedback received for the artifact exceeded a certain mark threshold" (Ross et al., 2014, p. 63). This model, according to the detailed report the facilitators wrote, seems to have turned out to be quite successful in creating learner-generated content, peer and social learning and interaction, and strong facilitator (teachers and teaching assistants) presence throughout the MOOC experience.

However, one must not overlook the main outcomes of the MOOC and aim to fulfill these outcomes through their design. As a matter of fact social interaction, and building an interactive community of learners who are interested in a specific topic, could be an outcome on its own; since it not only helps learners develop personal learning networks that could remain beneficial for them long after the MOOC is over, but it also teaches learners important skills and literacies such as digital literacy, social networking in online environments, and both the culture and skills of knowledge building, creating and sharing. This could possibly be done by allocating certain grades or requirements of MOOC participants to interact with each other and discuss the course content, or at the very least outline the benefits and importance of learner interaction early on in the course, so that learners can make an informed decision whether or not to interact with others, knowing about the positive potential of these interactions with other learners in the MOOCs. Cognitive presence was also reported by interviewees to be strong in that the weekly problems were at times thought-provoking and positively challenging. Also, most of them indicated that they could apply the knowledge they learned in the MOOC to their own contexts, personal or

professional, outside of the course. So MOOC designers need to not only keep that in mind, but also capitalize on this benefit of learning applying the content to their contexts by choosing to offer content that is open to this contextualization in diverse settings, which was in fact a recommendation mentioned by one of the interviewees.

It is also important to note that assessment of engagement in MOOCs can be quite challenging, since learner engagement differs greatly from one learner to another and there are many factors that affect learners' engagement in MOOCs. Therefore, one must not attempt to apply the same measurements of engagement that have been applied in education previously. Since MOOCs are a new phenomenon and learning that occurs in MOOCs is also very different than what occurs in traditional education, we cannot measure engagement the same way we measure it in for example traditional learning environments. To elaborate, in a face to face classroom, a student is determined to be attentive in the class if they seem to be listening to the instructor, but that learner could very well have their mind and attention elsewhere, which could also apply to learners watching videos in MOOCs. Learning analytics may determine that a learner watched an entire video; however, there is no indication as to whether that learner was indeed attentively and actively listening to the video instruction, or was thinking of something else, browsing the internet while the video played so not fully focused on the video content, or even not being in front of the video altogether. This difference in learning environments and the need to find different ways of looking into engagement also relates to the premise of the research conducted by Ramesh et al. (2013). Solving problems could actually be a better indicator of engagement than video watching, because it assesses whether they understood the content in the videos or not, however some people appear to have solved problems correctly and accordingly received a certificate, without having watched the videos at all. This, according to the instructor, is possible if a person is familiar with concepts of social media marketing or E-marketing through having experience in the field, either through work or studies. But some of the questions were very specific about content mentioned in the video, and the choices were very similar so one had to really understand the content and focus in order to answer correctly, which some of the interviewed learners appreciated, as aforementioned. Assessment strategies in MOOCs need to be different to embody the different pedagogical, interactive,

distributed nature of these courses. The most common assessments used in MOOCs are either automatically graded quizzes, which is prominent in xMOOCs and was also the method used in the E-Marketing MOOC, and moderated peer-assessment, which are also common in xMOOCs. Peer assessment might be the first step on the path of a different type of assessment for the MOOC setting, even though it has its downsides and critiques. But we also need to consider how MOOCs are informal learning environments, which in some ways could be argued to be a paradigm shift in the fields of informal education, adult learning and lifelong learning, and attempt to move away from trying to apply similar teaching and assessment strategies as ones used in formal learning environments. In fact Malcolm Knowles, who is a leading figure in the study of adult learning, said in his book about *Informal Adult Education* (1950),

> "[a]n informal course program must be kept highly flexible if it is to adapt itself continuously to the changing needs of adults. The best informal course programs seem to operate on an almost perpetual "emergency" basis, responding within a few days to a change in the headlines, altering their plans on short notice … This kind of flexibility is difficult to achieve if the informal course program is merely an appendage of some older, more routine type of program" (p. 88).

Additionally, with regards to evaluation and assessment of the informal learning experience, Knowles (1950) indicates that "every person who is in a position to make any kind of judgement about a program should be brought into the evaluation process" (p. 238), which includes participants, instructors, program director or staff, and outside experts. This pertains to the evaluation of the program, but I believe this extends and applies also to the assessment methods and who is in charge of assessment. These concepts relates to the self and peer assessment methods that are being conducted in MOOCs, but we would benefit from integrating these ideas even more purposefully in the design of assessments in MOOCs. Moreover, Learning analytics have been shown to be limited in terms of the meaningful information they offer to researchers. In fact, Ebner & Khalili (2016) concluded this in their study of two different MOOCs and learner engagement in them, they indicated that "while mainstream MOOC providers are continually developing their learning analytics

capacity, the current learning analytics output from these platforms is limited" (p. 89). This resonates with the conclusion from my research as well, because the learning analytics don't offer much information about learner engagement behavior with the course activities; there is no indication whether the learner watched a video or merely visited it for a few seconds, nor do they offer input on learners watching videos more than once. I think the only accurate information the analytics showed in the Edraak MOOC was the problem solving attempts, since it is only one attempt that is possible on the platform (even though Edraak permitted re-takes for certain users that had connectivity and technical problems while taking the quiz). But the analytics don't show if the learners answered correctly or incorrectly on each question; this shows only in the score each learner gets on their reports. Additionally, the analytics do not show much time learners spent trying to answer each quiz, which could be beneficial, if combined with deeper or more informative video watching analytics, because it could potentially show if learners struggled with specific problems or concepts, and therefore watched a specific video more than once.

Since MOOCs are a fairly recent phenomenon, there hasn't been much substantial research conducted on learning analytics of MOOCs. Based on the results of this study, indicators of engagement through watching videos and solving problems might not be the most appropriate method, since there was no statistical significance observed between engagement and CoI presences, which means that we need to find other ways of assessing engagement. However, the fact was that only one interviewee mentioned that her own perception of her engagement was low even though she was shown by the analytics to be higher than average engagement needs further research. After all this was one reflection from one learner in the MOOC, while others' perceptions of their own engagement were corroborated by the learning analytics. This could relate to emotional presence in the course or finding the course fun or interesting, as a detriment for engagement.

Connectivist MOOCs are spreading but I would say these are for people who want to develop their knowledge through networking and discussions. xMOOCs are more for people who are more interested in learning the content itself and receiving certificates, rather than discussing the content at a deeper level and forming connections of people, constructing knowledge together and having that personal

learning network. In my experience, most cMOOCs are about content that is constructed by learners themselves, and sometimes tends to be a little more advanced than xMOOCs, since they don't concern themselves with delivering information, but rather discussions and co-creation among the learners, which might make it difficult for learners with little to no experience in MOOCs or similar learning styles.

Recommendations for Future Research

This research study only focused on one MOOC, using it as a case study. However, it would be useful for the study of learner engagement in MOOCs to look into other MOOCs, and have comparative studies to outline the similarities and differences among learners with regards to engagement. Also, causational studies would greatly inform the research community about the factors that *lead* to both higher engagement as well as disengagement. In fact, most of the research that has been conducted in this field attempts to explain engagement, so more focus should be given to reasons for *disengagement* as well. Moreover, future research should dedicate some efforts to understanding and defining engagement in the context of MOOCs specifically, aside from any other learning space, so that we can possibly reach a framework for measuring engagement, and thus be able to use it to engage learners better. It's similar to the concept of backward design; if we know what the specific outcome is, we can accordingly know how to measure and assess it, which in turn can help us create the activities that will help learners reach these outcomes. A study by Gasevic et al., (2014) that analyzed research proposals submitted for the MOOC Research Initiative (MRI) indicated that the main research themes that could potentially create a framework of the future MOOC research are; 1) student engagement and learning success; 2) MOOC design and curriculum; 3) self-regulated learning and social learning; 4) social network analysis and networked learning; and 5) motivation, attitude and success criteria. All of these themes were either addressed in some detail or touched upon in my research, and I also recommend that future research on MOOCs dig deeper in these areas as a result of their clear importance for researchers in this field in particular, and the applicability of research findings to the educational innovation of MOOCs. Moreover, as Veletsianos et al. (2016) note, learning occurs both inside and outside the MOOC platform, which can't be understood or analyzed without in depth conversations with the learners themselves in order to grasp these concepts, and only then can we conduct a thematic analysis of certain themes that emerge from these conversations.

With regards to research methods, not only can qualitative research offer deep and meaningful insights through conducting interviews with participants to

discuss their perceptions of their own engagement, but also quantitative content and social network analysis can portray results that could be meaningful for the study of learner engagement in MOOCs, which is recommendation echoed by Clow (2013) in his discussion on participation patterns in cMOOCs. For the study of social presence, content analysis of discussion board posts and responses could potentially offer rich information about the way learners interact with one another, in both cMOOCs and xMOOCs. In relation to CoI, this content analysis could be thematic, so as to look for the CoI presences using only the discussion board posts and responses.

The importance of region and context-specific research cannot be emphasized enough. Not only has MOOC research been conducted since 2008, it has also predominantly been conducted in North America (Gasevic, Kovanovic, Joksimovic & Siemens, 2014; Bali, 2014b). I echo these scholars' recommendation of conducting research in other areas of the world, but I more specifically recommend this research to be conducted in the Middle East and the Arab World. Contextualizing educational innovations for different regions of the world is imperative not only for appropriate adoption of these innovations, but also for creating region, culture and nation-specific research, practice, and even assessment.

Finally, since many learners enroll in MOOCs for professional development purposes, future research could look into how much professional development actually occurs from learning in MOOCs, employers' perspectives on the benefit for their contexts, and possibly what could be the effects of accrediting MOOC certificates for employment. As has been established in the literature, previous research studies conducted on how adult learners learn, as well as this research study, show that self-regulated learning is very important for the success of any adult learning experience. Thus considering self-regulated learning and motivation in the design of online learning experiences is imperative. Since the success of a MOOC isn't defined by completion, but rather by the engagement of each learner in the MOOC based on their own goals, motivation and self-regulation of learning, research in this field in particular needs to be informed by learners' perceptions, reflections and experiences. If one aims to develop a framework for engaging learners in MOOCs, these aspects are very important to consider. Only by conducting research on large and diverse

samples and thematically analyzing these research outcomes in detail can we be able to put some dots that could potentially be connected to form such a framework. This is a very big and wide recommendation; however, we will not be able to come closer to developing such a framework if we do not dig deeper into these abstract constructs of motivation, lifelong learning and engagement.

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Appendix A: Community of Inquiry Survey Instrument

Community of Inquiry Survey Instrument (draft v14)

Teaching Presence

Design & Organization

1. The instructor clearly communicated important course topics.
2. The instructor clearly communicated important course goals.
3. The instructor provided clear instructions on how to participate in course learning activities.
4. The instructor clearly communicated important due dates/time frames for learning activities.

Facilitation

5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.
7. The instructor helped to keep course participants engaged and participating in productive dialogue.
8. The instructor helped keep the course participants on task in a way that helped me to learn.
9. The instructor encouraged course participants to explore new concepts in this course.
10. Instructor actions reinforced the development of a sense of community among course participants.

Direct Instruction

11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.
12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.

13. The instructor provided feedback in a timely fashion.

Social Presence

Affective expression

14. Getting to know other course participants gave me a sense of belonging in the course.
15. I was able to form distinct impressions of some course participants.
16. Online or web-based communication is an excellent medium for social interaction.

Open communication

17. I felt comfortable conversing through the online medium.
18. I felt comfortable participating in the course discussions.
19. I felt comfortable interacting with other course participants.

Group cohesion

20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.
21. I felt that my point of view was acknowledged by other course participants.
22. Online discussions help me to develop a sense of collaboration.

Cognitive Presence

Triggering event

23. Problems posed increased my interest in course issues.

24. Course activities piqued my curiosity.

25. I felt motivated to explore content related questions.

Exploration

26. I utilized a variety of information sources to explore problems posed in this course.

27. Brainstorming and finding relevant information helped me resolve content related questions.

28. Online discussions were valuable in helping me appreciate different perspectives.

Integration

29. Combining new information helped me answer questions raised in course activities.

30. Learning activities helped me construct explanations/solutions.

31. Reflection on course content and discussions helped me understand fundamental concepts in this class.

Resolution

32. I can describe ways to test and apply the knowledge created in this course.

33. I have developed solutions to course problems that can be applied in practice.

34. I can apply the knowledge created in this course to my work or other non-class related activities.

<u>5 point Likert-type scale</u>

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Appendix B: Learners Interview Questions

اسئلة المتفاعلين

- بلد المنشأ /الجنسية؟
- الدرجة العلمية؟ ذات صلة بالمجال؟ في أي مجال؟
- ماهي لغتك المستخدمة في التعليم طوال سنوات الدراسة؟
- هل اشتركت في المساقات من قبل؟ إذا كانت الإجابة بنعم ، هل يمكنك أن تخبرني ما هي الدورة التدريبية وما سبب انضمامك إلى هذا المساق؟ هل حصلت على المحتوى التعليمي المناسب لتوقعاتك؟
- ما الذي دفعك للانضمام إلى هذا المساق؟
- ماذا كانت توقعاتك للإستفادة من هذا المساق عند الإشتراك؟ (التعلم / بناء علاقات اجتماعية و احترافية / التواصل .. الخ).
- هل حصلت على ما تحتاجه من هذه التجربة؟
- ما هو رأيك في البنية التصميمية للمساق؟ طريقة عرض المحتوى وتنظيمه؟ طريقة وضع الواجبات؟ طريقة تفاعل المعلم مع المتعلمين وتقديم الملاحظات والإفادة الارتجاعية؟
- في رأيك، ما هي بعض العوامل المحددة التي كانت السبب في استكمال المشاركة/التفاعل؟ (عناصر تصميم المساق بالإضافة إلي الأسباب الشخصية).
- ما هي بعض الطرق التي استخدمتها لتنظيم التعلم الخاص بك في المساق؟ (يمكن أن تكون هذه آليات دراسية، حيل لإدارة الوقت ... الخ).
- قارن الدافع الخاص بك للتفاعل في هذا المساق مع دورة تعليمية على الإنترنت تحمل رصيد تعليمي و تحسب كجزء من درجة علمية أو دبلوم.
- قارن الدافع الخاص بك للتفاعل في هذا المساق مع دورات ذات رصيد تعليمي تتم وجها لوجه
- قارن الدافع الخاص للتفاعل في هذا المساق مع دورات لا تحمل رصيد تعليمي تتم وجها لوجه.
- هل سمح لك المساق بمتابعة وتيرة التعلم الشخصية الخاصة بك؟ وضح بإستفاضة.
- هل سمح لك المساق /أمكنك من المزج بين محتوى المساق مع مسار التعلم الخاص بك؟
- التعلم مدى الحياة هو توفير أو استخدام فرص التعلم الرسمية والغير رسمية على حد سواء طوال حياة الناس من أجل التطوير باستمرار وتحسين المعرفة والمهارات اللازمة للتوظيف والإنجازات الشخصية. بشكل عام ، هل تعتقد ان المساق ساعدك أن تكون متعلما مدى الحياة؟
- هل جعلك المساق تكتسب مهارات أو كفاءات جديدة تضيف إلى مهنتك؟ ماهي تلك المهارات وكيف كانت مفيدة لمهنتك؟
- هل استطعت تطبيق التعلم الخاص بك في حياتك المهنية أو الشخصية؟ إذا كانت الاجابة بنعم ، كيف تم ذلك؟
- من حيث المحتوى ، الوتيرة وبيئة التعلم ، هل تقول ان تجربة المساق كانت مرنة؟ وضح بإستفاضة.
- ماهي نسبة أنشطة المساق التي تمكنت من الانتهاء منها؟ (جميع الانشطة التي تشمل الاسئلة ، الاختبارات ، الواجبات ، المناقشات .. الخ)
- هل تفكر في الإنضمام إلى مساقات أخرى في المستقبل؟ (إذا كنت قررت ذلك سابقا ، أي مساق تم اختياره ولماذا؟)
- هل تفكر في الإنضمام إلى مساقات أخرى في المستقبل من تلك التي تقدمها ادراك (إذا كنت قررت ذلك سابقا ، أي مساق تم اختياره ولماذا؟)

اسئلة الغير المتفاعلين

- بلد المنشأ /الجنسية؟
- الدرجة العلمية؟ ذات صلة بالمجال؟ في أي مجال؟
- ماهي لغتك المستخدمة في التعليم طوال سنوات الدراسة؟
- هل اشتركت في المساقات من قبل؟ إذا كانت الإجابة بنعم ، هل يمكنك أن تخبرني ما هي الدورة التدريبية وما سبب انضمامك إلى هذا المساق؟ هل حصلت على المحتوى التعليمي المناسب لتوقعاتك؟
- ما الذي دفعك للانضمام إلى هذا المساق؟
- ماذا كانت توقعاتك للإستفادة من هذا المساق عند الإشتراك؟ (التعلم / بناء علاقات اجتماعية و احترافية / التواصل .. الخ).
- هل حصلت على ما تحتاجه من هذه التجربة؟

- ما هو رأيك في البنية التصميمية للمساق؟ طريقة عرض المحتوى وتنظيمه؟ طريقة وضع الواجبات؟ طريقة تفاعل المعلم مع المتعلمين وتقديم الملاحظات والإفادة الارتجاعية؟
- في رأيك، ما هي بعض العوامل المحددة التي كانت السبب في عدم استكمال المشاركة/التفاعل؟ (عناصر تصميم المساق بالإضافة إلي الأسباب الشخصية)
- ما هي بعض الطرق التي استخدمتها لتنظيم التعلم الخاص بك في المساق؟ (يمكن أن تكون هذه آليات دراسية، حيل لإدارة الوقت ... الخ).
- هل سمح لك المساق بمتابعة وتيرة التعلم الشخصية الخاصة بك؟ وضح بإستفاضة.
- هل سمح لك المساق /أمكنك من المزج بين محتوى المساق مع مسار التعلم الخاص بك؟
- التعلم مدى الحياة هو توفير أو استخدام فرص التعلم الرسمية والغير رسمية على حد سواء طوال حياة الناس من أجل التطوير باستمرار وتحسين المعرفة والمهارات اللازمة للتوظيف والإنجازات الشخصية. بشكل عام ، هل تعتقد ان المساق ساعدك أن تكون متعلما مدى الحياة؟
- هل جعلك المساق تكتسب مهارات أو كفاءات جديدة تضيف إلى مهنتك؟ ماهي تلك المهارات وكيف كانت مفيدة لمهنتك؟
- هل استطعت تطبيق التعلم الخاص بك في حياتك المهنية أو الشخصية؟ إذا كانت الاجابة بنعم ، كيف تم ذلك؟
- من حيث المحتوى ، الوتيرة وبيئة التعلم ، هل تقول ان تجربة المساق كانت مرنة؟ وضح بإستفاضة.
- ماهي نسبة أنشطة المساق التي تمكنت من الانتهاء منها؟ (جميع الانشطة التي تشمل الاسئلة ، الاختبارات ، الواجبات ، المناقشات .. الخ)
- هل تفكر في الإنضمام إلى مساقات أخرى في المستقبل؟ (إذا كنت قررت ذلك سابقا ، أي مساق تم اختياره ولماذا؟)
- هل تفكر في الإنضمام إلى مساقات أخرى في المستقبل من تلك التي تقدمها ادراك (إذا كنت قررت ذلك سابقا ، أي مساق تم اختياره ولماذا؟)

أسئلة المعلم وفريق تصميم المساق

- ماذا كانت أهدافك التي أدت إلى تصميم المساق بالطريقة التي استخدمتها؟
- هل خططت لأي أنشطة تشمل التفاعل مع المعلم؟ هل تمت تلك الأنشطة بالطريقة التي خططت إليها؟
- هل خططت لأي أنشطة تشمل التفاعل الاجتماعي بين المشاركين؟ هل تمت تلك الأنشطة بالطريقة التي خططت إليها؟
- ماذا كانت خطتك بخصوص الافادة الارتجاعية ؟ هل كانت تعتمد في الأغلب على الخاصة بالمعلم أو الخاصة بـالنظراء أم تلك الخاصة بالمعيدين؟ هل يمكنك توضيح الأسباب الخاصة بإختيار هذه الطريقة بالتفصيل؟
- ماهي طرق التقييم التي استخدمتها؟
- هل كنت تهدف إلى تقييم بطريقة (نجاح /عدم نجاح)؟ أم كنت تهدف إلى تقييم ذاتي؟ كيف تم تحديد حصول المشارك بالمساق على شهادة علمية؟
- في رأيك ، هل تقول ان هذا المساق كان ناجحا ، أم كان يحتاج إلى تحسين؟ (استنادا إلى فرضية ان المساقات هي دورات تعليمية ضخمة على الإنترنت لا تحمل رصيدا تعليميا).

For the course instructor and possibly MOOC design team.

How did you design the MOOC? What types of activities will you use?
Is there a rationale for why you designed it this way?
What are the assessment techniques you will use?
What was your intention/goal for designing the MOOC the way you did?
Did you plan for activities that involve teacher interaction? Like what? Did they occur the way you planned?
Did you plan for activities that involve Social interaction among the participants? Like what? Did they occur the way you had planned?

What is your plan re feedback? Was it mostly based on instructor-feedback or peer-feedback or TA-feedback? Can you elaborate on the reasons you chose this method?

What were the assessment methods that you used?
Were you aiming for a pass/fail assessment? Or were you aiming for self-assessment?
Based on what did you determine that a MOOC participant received a certificate?
Would you say this was successful or needed improvement? (Based on the premise that MOOCs are non-credit bearing online courses that are massive)

Appendix C: Chi-square Test Results
Engagement with video watching and solving problems, and Pre-MOOC survey variables and responses.

Variable 1	Variable 2	Chi Square Test Result	Significance (< or > .05)
Video watching	Gender	**χ^2 (1, N=2040) = .68, p = 0.4**	**(p > .05)**
Video watching	Education level	**χ^2 (7, N=2040) = 4.61, p = 0.7**	**(p > .05)**
Video watching	Goal of enrollment	**χ^2 (4, N=2040) = 12.3, p = 0.015**	**(p < .05)**
Video watching	Motivation for enrollment	**χ^2 (15, N=2040) = 23.8, p = 0.082**	**(p > .05)**
Video watching	Knowledge of MOOC subject	**χ^2 (5, N=2040) = 11.18, p = 0.048**	**(p < .05)**
Video watching	Nature of job	**χ^2 (21, N=2040) = 29.43, p = 0.104**	**(p > .05)**
Video watching	Previous MOOC enrollment	**χ^2 (1, N=2040) = 19.88, p = 0.000**	**(p < .05)**
Video watching	Preferred language	**χ^2 (4, N=2040) = 12.24, p = 0.016**	**(p < .05)**
Video watching	Education degree	**χ^2 (6, N=2040) = 8.87, p = 0.181**	**(p > .05)**
Video watching	Age Group	**χ^2 (5, N=2040) = 27.99, p = 0.000**	**(p < .05)**
Video watching	Primary Occupation	**χ^2 (7, N=2040) = 25.52, p = 0.001**	**(p < .05)**
Video watching	Achievement sense of completing requirements	**χ^2 (4, N=1975) = 6.75, p = 0.150**	**(p > .05)**
Video watching	Importance of expressing opinions without embarrassment	**χ^2 (4, N=1975) = 3.11, p = 0.538**	**(p > .05)**
Video watching	Learning for enjoyment of learning	**χ^2 (4, N=1975) = 2.08, p = 0.720**	**(p > .05)**
Video watching	Importance of instructor feedback	**χ^2 (4, N=1975) = .847, p = 0.932**	**(p > .05)**
Video watching	Self motivation and praise in absence of instructor	**χ^2 (4, N=1975) = 9.18, p = 0.057**	**(p < .05)**
Video watching	Importance of knowing grades throughout MOOC	**χ^2 (4, N=1975) = .229, p = 0.994**	**(p > .05)**
Video watching	Certificate Eligibility	**χ^2 (1, N=1998) = 592.05, p = 0.000**	**(p < .05)**

Variable 1	Variable 2	Chi Square Test Result	Significance

			(< or > .05)
Solving Problems	Gender	**χ^2 (1, N=2040) = 5.32, p = 0.021**	**(p < .05)**
Solving Problems	Education level	**χ^2 (7, N=2040) = 6.97, p = 0.431**	**(p > .05)**
Solving Problems	Goal of enrollment	**χ^2 (4, N=2040) = 12.91, p = 0.012**	**(p < .05)**
Solving Problems	Motivation for enrollment	**χ^2 (15, N=2040) = 11.68, p = 0.703**	**(p > .05)**
Solving Problems	Knowledge of MOOC subject	**χ^2 (5, N=2040) = 14.15, p = 0.015**	**(p < .05)**
Solving Problems	Nature of job	**χ^2 (21, N=2040) = 15.68, p = 0.785**	**(p > .05)**
Solving Problems	Previous MOOC enrollment	**χ^2 (1, N=2040) = 8.43, p = 0.004**	**(p < .05)**
Solving Problems	Preferred language	**χ^2 (4, N=2040) = 19.88, p = 0.001**	**(p < .05)**
Solving Problems	Education degree	**χ^2 (6, N=2040) = 3.75, p = 0.710**	**(p > .05)**
Solving Problems	Age Group	**χ^2 (5, N=2040) = 18.34, p = 0.003**	**(p < .05)**
Solving Problems	Primary Occupation	**χ^2 (7, N=2040) = 12.64, p = 0.081**	**(p > .05)**
Solving Problems	Achievement sense of completing requirements	**χ^2 (4, N=1975) = 8,694, p = 0.069**	**(p > .05)**
Solving Problems	Importance of expressing opinions without embarrassment	**χ^2 (4, N=1975) = 1.72, p = 0.786**	**(p > .05)**
Solving Problems	Learning for enjoyment of learning	**χ^2 (4, N=1975) = 2.42, p = 0.659**	**(p > .05)**
Solving Problems	Importance of instructor feedback	**χ^2 (4, N=1975) = 1.07, p = 0.898**	**(p > .05)**
Solving Problems	Self motivation and praise in absence of instructor	**χ^2 (4, N=1975) = 15.44, p = 0.004**	**(p < .05)**
Solving Problems	Importance of knowing grades throughout MOOC	**χ^2 (4, N=1975) = 2.03, p = 0.729**	**(p > .05)**
Solving Problems	Certificate Eligibility	**χ^2 (1, N=1998) = 846.46, p = 0.000**	**(p < .05)**

Engagement with video watching and solving problems, and Community of Inquiry Survey Responses

Variable 1	Variable 2	Chi Square Test Result	Significance (< or > .05)
Video watching	Perception of Teaching Presence	**χ^2 (1, N=126) = 1.44, p = 0.229**	**(p > .05)**
Video watching	Perception of Social Presence	**χ^2 (1, N=126) = 1.98, p = 0.159**	**(p > .05)**
Video watching	Perception of Cognitive Presence	**χ^2 (1, N=126) = 2.53, p = 0.111**	**(p > .05)**
Video watching	Perception of all presences	**χ^2 (1, N=126) = 2.30, p = 0.129**	**(p > .05)**
Variable 1	Variable 2	Chi Square Test Result	Significance (< or > .05)
Solving Problems	Perception of Teaching Presence	**χ^2 (1, N=126) = .27, p = 0.602**	**(p > .05)**
Solving Problems	Perception of Social Presence	**χ^2 (1, N=126) = .816, p = 0.366**	**(p > .05)**
Solving Problems	Perception of Cognitive Presence	**χ^2 (1, N=126) = 1.04, p = 0.307**	**(p > .05)**
Solving Problems	Perception of all presences	**χ^2 (1, N=126) = .225, p = 0.635**	**(p > .05)**

Appendix D: Chi Square Cross Tabulations

Videos Engagement Level * Gender

Crosstab

			Gender		
			F	M	Total
Videos Engagement Level	0	Count	498	679	1177
		Expected Count	507.1	669.9	1177.0
		% within Videos Engagement Level	42.3%	57.7%	100.0%
		% within Gender	56.7%	58.5%	57.7%
		% of Total	24.4%	33.3%	57.7%
	1	Count	381	482	863
		Expected Count	371.9	491.1	863.0
		% within Videos Engagement Level	44.1%	55.9%	100.0%
		% within Gender	43.3%	41.5%	42.3%
		% of Total	18.7%	23.6%	42.3%
Total		Count	879	1161	2040
		Expected Count	879.0	1161.0	2040.0
		% within Videos Engagement Level	43.1%	56.9%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	43.1%	56.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.685[a]	1	0.408		
Continuity Correction[b]	0.613	1	0.434		
Likelihood Ratio	0.685	1	0.408		
Fisher's Exact Test				0.416	0.217
N of Valid Cases	2040				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 371.85.

b. Computed only for a 2x2 table

Figure 5: Videos engagement level and Gender Crosstab and Chi-Square Test

Problems Engagement Level * Gender

Crosstab

			Gender		
			F	M	Total
Problems Engagement Level	0	Count	453	658	1111
		Expected Count	478.7	632.3	1111.0
		% within Problems Engagement Level	40.8%	59.2%	100.0%
		% within Gender	51.5%	56.7%	54.5%
		% of Total	22.2%	32.3%	54.5%
	1	Count	426	503	929
		Expected Count	400.3	528.7	929.0
		% within Problems Engagement Level	45.9%	54.1%	100.0%
		% within Gender	48.5%	43.3%	45.5%
		% of Total	20.9%	24.7%	45.5%
Total		Count	879	1161	2040
		Expected Count	879.0	1161.0	2040.0
		% within Problems Engagement Level	43.1%	56.9%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	43.1%	56.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.328[a]	1	0.021		
Continuity Correction[b]	5.123	1	0.024		
Likelihood Ratio	5.326	1	0.021		
Fisher's Exact Test				0.022	0.012
N of Valid Cases	2040				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 400.29.

b. Computed only for a 2x2 table

Figure 6: Solving Problems engagement level and Gender Crosstab and Chi-Square Test

Videos Engagement Level * PRM001

Crosstab

			Goal of joining MOOC					
			0	1	2	3	4	Total
Videos Engagement Level	0	Count	14	807	215	87	54	1177
		Expected Count	9.8	818.7	221.6	84.2	42.7	1177.0
		% within Videos Engagement Level	1.2%	68.6%	18.3%	7.4%	4.6%	100.0%
		% within PRM001	82.4%	56.9%	56.0%	59.6%	73.0%	57.7%
		% of Total	0.7%	39.6%	10.5%	4.3%	2.6%	57.7%
	1	Count	3	612	169	59	20	863
		Expected Count	7.2	600.3	162.4	61.8	31.3	863.0
		% within Videos Engagement Level	0.3%	70.9%	19.6%	6.8%	2.3%	100.0%
		% within PRM001	17.6%	43.1%	44.0%	40.4%	27.0%	42.3%
		% of Total	0.1%	30.0%	8.3%	2.9%	1.0%	42.3%
Total		Count	17	1419	384	146	74	2040
		Expected Count	17.0	1419.0	384.0	146.0	74.0	2040.0
		% within Videos Engagement Level	0.8%	69.6%	18.8%	7.2%	3.6%	100.0%
		% within PRM001	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	0.8%	69.6%	18.8%	7.2%	3.6%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.378[a]	4	0.015
Likelihood Ratio	13.232	4	0.010
Linear-by-Linear Association	2.654	1	0.103
N of Valid Cases	2040		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.19.

Figure 7: Videos engagement level and goal of joining MOOC Crosstab and Chi-Square Test

Problems Engagement Level * PRM001

Crosstab

			Goal for MOOC					
			0	1	2	3	4	Total
Problems Engagement Level	0	Count	13	751	208	88	51	1111
		Expected Count	9.3	772.8	209.1	79.5	40.3	1111.0
		% within Problems Engagement Level	1.2%	67.6%	18.7%	7.9%	4.6%	100.0%
		% within PRM001	76.5%	52.9%	54.2%	60.3%	68.9%	54.5%
		% of Total	0.6%	36.8%	10.2%	4.3%	2.5%	54.5%
	1	Count	4	668	176	58	23	929
		Expected Count	7.7	646.2	174.9	66.5	33.7	929.0
		% within Problems Engagement Level	0.4%	71.9%	18.9%	6.2%	2.5%	100.0%
		% within PRM001	23.5%	47.1%	45.8%	39.7%	31.1%	45.5%
		% of Total	0.2%	32.7%	8.6%	2.8%	1.1%	45.5%
Total		Count	17	1419	384	146	74	2040
		Expected Count	17.0	1419.0	384.0	146.0	74.0	2040.0
		% within Problems Engagement Level	0.8%	69.6%	18.8%	7.2%	3.6%	100.0%
		% within PRM001	100.0%	100.0%	100.0%	100.0 %	100.0%	100.0%
		% of Total	0.8%	69.6%	18.8%	7.2%	3.6%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.911[a]	4	0.012
Likelihood Ratio	13.357	4	0.010
Linear-by-Linear Association	6.197	1	0.013
N of Valid Cases	2040		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.74.

Figure 8: Solving Problems engagement level and goal for MOOC Crosstab and Chi-Square Test

Videos Engagement Level * Certificate Eligibility Crosstab

			Certificate Eligibility		
			0	1	Total
Videos Engagement Level	0	Count	1082	67	1149
		Expected Count	844.8	304.2	1149.0
		% within Videos Engagement Level	94.2%	5.8%	100.0%
		% within Certificate Eligible	73.7%	12.7%	57.5%
		% of Total	54.2%	3.4%	57.5%
	1	Count	387	462	849
		Expected Count	624.2	224.8	849.0
		% within Videos Engagement Level	45.6%	54.4%	100.0%
		% within Certificate Eligible	26.3%	87.3%	42.5%
		% of Total	19.4%	23.1%	42.5%
Total		Count	1469	529	1998
		Expected Count	1469.0	529.0	1998.0
		% within Videos Engagement Level	73.5%	26.5%	100.0%
		% within Certificate Eligible	100.0%	100.0%	100.0%
		% of Total	73.5%	26.5%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	592.058[a]	1	0.000		
Continuity Correction[b]	589.565	1	0.000		
Likelihood Ratio	628.449	1	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	591.762	1	0.000		
N of Valid Cases	1998				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 224.79.

b. Computed only for a 2x2 table

Figure 9: Watching videos engagement level and certificate eligibility Crosstab and Chi-square Test

Problems Engagement Level * Certificate Eligibility

Crosstab

			Certificate Eligibility		
			0	1	Total
Problems Engagement Level	0	Count	1080	0	1080
		Expected Count	794.1	285.9	1080.0
		% within Problems Engagement Level	100.0%	0.0%	100.0%
		% within Certificate Eligible	73.5%	0.0%	54.1%
		% of Total	54.1%	0.0%	54.1%
	1	Count	389	529	918
		Expected Count	674.9	243.1	918.0
		% within Problems Engagement Level	42.4%	57.6%	100.0%
		% within Certificate Eligible	26.5%	100.0%	45.9%
		% of Total	19.5%	26.5%	45.9%
Total		Count	1469	529	1998
		Expected Count	1469.0	529.0	1998.0
		% within Problems Engagement Level	73.5%	26.5%	100.0%
		% within Certificate Eligible	100.0%	100.0%	100.0%
		% of Total	73.5%	26.5%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	846.468[a]	1	0.000		
Continuity Correction[b]	843.510	1	0.000		
Likelihood Ratio	1058.432	1	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	846.044	1	0.000		
N of Valid Cases	1998				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 243.05.
b. Computed only for a 2x2 table

Figure 10: Solving problems engagement level and certificate eligibility Crosstab and Chi-square Test

Videos Engagement Level * PRM003

Crosstab

			Knowledge about MOOC Subject						
			0	1	2	3	4	5	Total
Videos Engagement Level	0	Count	11	182	97	84	413	390	1177
		Expected Count	9.2	202.5	90.0	88.3	420.0	366.9	1177.0
		% within Videos Engagement Level	0.9%	15.5%	8.2%	7.1%	35.1%	33.1%	100.0%
		% within PRM003	68.8%	51.9%	62.2%	54.9%	56.7%	61.3%	57.7%
		% of Total	0.5%	8.9%	4.8%	4.1%	20.2%	19.1%	57.7%
	1	Count	5	169	59	69	315	246	863
		Expected Count	6.8	148.5	66.0	64.7	308.0	269.1	863.0
		% within Videos Engagement Level	0.6%	19.6%	6.8%	8.0%	36.5%	28.5%	100.0%
		% within PRM003	31.3%	48.1%	37.8%	45.1%	43.3%	38.7%	42.3%
		% of Total	0.2%	8.3%	2.9%	3.4%	15.4%	12.1%	42.3%
Total		Count	16	351	156	153	728	636	2040
		Expected Count	16.0	351.0	156.0	153.0	728.0	636.0	2040.0
		% within Videos Engagement Level	0.8%	17.2%	7.6%	7.5%	35.7%	31.2%	100.0%
		% within PRM003	100.0%	100.0 %	100.0 %	100.0 %	100.0 %	100.0%	100.0%
		% of Total	0.8%	17.2%	7.6%	7.5%	35.7%	31.2%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.188[a]	5	0.048
Likelihood Ratio	11.207	5	0.047
Linear-by-Linear Association	4.289	1	0.038
N of Valid Cases	2040		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.77.

Figure 11: Watching Videos engagement level and knowledge about MOOC subject Crosstab and Chi-Square Test

Problems Engagement Level * PRM003

Crosstab

			Knowledge about MOOC subject						
			0	1	2	3	4	5	Total
Problems Engagement Level	0	Count	10	174	83	78	383	383	1111
		Expected Count	8.7	191.2	85.0	83.3	396.5	346.4	1111.0
		% within Problems Engagement Level	0.9%	15.7%	7.5%	7.0%	34.5%	34.5%	100.0 %
		% within PRM003	62.5%	49.6%	53.2%	51.0%	52.6%	60.2%	54.5%
		% of Total	0.5%	8.5%	4.1%	3.8%	18.8%	18.8%	54.5%
	1	Count	6	177	73	75	345	253	929
		Expected Count	7.3	159.8	71.0	69.7	331.5	289.6	929.0
		% within Problems Engagement Level	0.6%	19.1%	7.9%	8.1%	37.1%	27.2%	100.0 %
		% within PRM003	37.5%	50.4%	46.8%	49.0%	47.4%	39.8%	45.5%
		% of Total	0.3%	8.7%	3.6%	3.7%	16.9%	12.4%	45.5%
Total		Count	16	351	156	153	728	636	2040
		Expected Count	16.0	351.0	156.0	153.0	728.0	636.0	2040.0
		% within Problems Engagement Level	0.8%	17.2%	7.6%	7.5%	35.7%	31.2%	100.0 %
		% within PRM003	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
		% of Total	0.8%	17.2%	7.6%	7.5%	35.7%	31.2%	100.0 %

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.157[a]	5	0.015
Likelihood Ratio	14.223	5	0.014
Linear-by-Linear Association	7.805	1	0.005
N of Valid Cases	2040		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.29.

Figure 12: Solving Problems engagement level and knowledge about MOOC subject Crosstab and Chi-Square Test

Videos Engagement Level * PRM005

Crosstab

			Previous enrollment in a MOOC		
			1	2	Total
Videos Engagement Level	0	Count	467	710	1177
		Expected Count	516.4	660.6	1177.0
		% within Videos Engagement Level	39.7%	60.3%	100.0%
		% within PRM005	52.2%	62.0%	57.7%
		% of Total	22.9%	34.8%	57.7%
	1	Count	428	435	863
		Expected Count	378.6	484.4	863.0
		% within Videos Engagement Level	49.6%	50.4%	100.0%
		% within PRM005	47.8%	38.0%	42.3%
		% of Total	21.0%	21.3%	42.3%
Total		Count	895	1145	2040
		Expected Count	895.0	1145.0	2040.0
		% within Videos Engagement Level	43.9%	56.1%	100.0%
		% within PRM005	100.0%	100.0%	100.0%
		% of Total	43.9%	56.1%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	19.887[a]	1	0.000		
Continuity Correction[b]	19.487	1	0.000		
Likelihood Ratio	19.874	1	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	19.878	1	0.000		
N of Valid Cases	2040				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 378.62.

b. Computed only for a 2x2 table

Figure 13: Watching videos engagement level and Previous MOOC enrollment Crosstab and Chi-Square Test

Problems Engagement Level * PRM005

Crosstab

			Previous MOOC enrollment		
			1	2	Total
Problems Engagement Level	0	Count	455	656	1111
		Expected Count	487.4	623.6	1111.0
		% within Problems Engagement Level	41.0%	59.0%	100.0%
		% within PRM005	50.8%	57.3%	54.5%
		% of Total	22.3%	32.2%	54.5%
	1	Count	440	489	929
		Expected Count	407.6	521.4	929.0
		% within Problems Engagement Level	47.4%	52.6%	100.0%
		% within PRM005	49.2%	42.7%	45.5%
		% of Total	21.6%	24.0%	45.5%
Total		Count	895	1145	2040
		Expected Count	895.0	1145.0	2040.0
		% within Problems Engagement Level	43.9%	56.1%	100.0%
		% within PRM005	100.0%	100.0%	100.0%
		% of Total	43.9%	56.1%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.439[a]	1	0.004		
Continuity Correction[b]	8.180	1	0.004		
Likelihood Ratio	8.437	1	0.004		
Fisher's Exact Test				0.004	0.002
Linear-by-Linear Association	8.434	1	0.004		
N of Valid Cases	2040				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 407.58.

b. Computed only for a 2x2 table

Figure 14: Solving problems engagement level and Previous MOOC enrollment Crosstab and Chi-Square Test

Videos Engagement Level * PRM008

Crosstab

			Age Group						
			0	1	2	3	4	5	Total
Videos Engagement Level	0	Count	56	46	570	395	92	18	1177
		Expected Count	44.4	36.3	543.5	422.3	108.5	21.9	1177.0
		% within Videos Engagement Level	4.8%	3.9%	48.4%	33.6%	7.8%	1.5%	100.0%
		% within PRM008	72.7%	73.0%	60.5%	54.0%	48.9%	47.4%	57.7%
		% of Total	2.7%	2.3%	27.9%	19.4%	4.5%	0.9%	57.7%
	1	Count	21	17	372	337	96	20	863
		Expected Count	32.6	26.7	398.5	309.7	79.5	16.1	863.0
		% within Videos Engagement Level	2.4%	2.0%	43.1%	39.0%	11.1%	2.3%	100.0%
		% within PRM008	27.3%	27.0%	39.5%	46.0%	51.1%	52.6%	42.3%
		% of Total	1.0%	0.8%	18.2%	16.5%	4.7%	1.0%	42.3%
Total		Count	77	63	942	732	188	38	2040
		Expected Count	77.0	63.0	942.0	732.0	188.0	38.0	2040.0
		% within Videos Engagement Level	3.8%	3.1%	46.2%	35.9%	9.2%	1.9%	100.0%
		% within PRM008	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	3.8%	3.1%	46.2%	35.9%	9.2%	1.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	27.994[a]	5	0.000
Likelihood Ratio	28.570	5	0.000
Linear-by-Linear Association	26.450	1	0.000
N of Valid Cases	2040		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.08.

Figure 15: Video engagement level and Age Group Crosstab and Chi-Square Test

Problems Engagement Level * PRM008

Crosstab

			Age Group						
			0	1	2	3	4	5	Total
Problems Engagement Level	0	Count	53	40	534	379	87	18	1111
		Expected Count	41.9	34.3	513.0	398.7	102.4	20.7	1111.0
		% within Problems Engagement Level	4.8%	3.6%	48.1%	34.1%	7.8%	1.6%	100.0 %
		% within PRM008	68.8%	63.5%	56.7%	51.8%	46.3%	47.4%	54.5%
		% of Total	2.6%	2.0%	26.2%	18.6%	4.3%	0.9%	54.5%
	1	Count	24	23	408	353	101	20	929
		Expected Count	35.1	28.7	429.0	333.3	85.6	17.3	929.0
		% within Problems Engagement Level	2.6%	2.5%	43.9%	38.0%	10.9%	2.2%	100.0 %
		% within PRM008	31.2%	36.5%	43.3%	48.2%	53.7%	52.6%	45.5%
		% of Total	1.2%	1.1%	20.0%	17.3%	5.0%	1.0%	45.5%
Total		Count	77	63	942	732	188	38	2040
		Expected Count	77.0	63.0	942.0	732.0	188.0	38.0	2040.0
		% within Problems Engagement Level	3.8%	3.1%	46.2%	35.9%	9.2%	1.9%	100.0 %
		% within PRM008	100.0%	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
		% of Total	3.8%	3.1%	46.2%	35.9%	9.2%	1.9%	100.0 %

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18.343[a]	5	0.003
Likelihood Ratio	18.559	5	0.002
Linear-by-Linear Association	17.649	1	0.000
N of Valid Cases	2040		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 17.30.

Figure 16: Solving problems engagement level and Age Group Crosstab and Chi-Square Test

Videos Engagement Level * PRM009

Crosstab

			Primary Occupation								
			0	1	2	3	4	5	6	7	Total
Videos Engagement Level	0	Count	58	223	199	138	288	62	208	1	1177
		Expected Count	47.3	233.1	203.1	157.5	273.5	49.0	210.6	2.9	1177.0
		% within Videos Engagement Level	4.9%	18.9%	16.9%	11.7%	24.5%	5.3%	17.7%	0.1%	100.0%
		% within PRM009	70.7%	55.2%	56.5%	50.5%	60.8%	72.9%	57.0%	20.0%	57.7%
		% of Total	2.8%	10.9%	9.8%	6.8%	14.1%	3.0%	10.2%	0.0%	57.7%
	1	Count	24	181	153	135	186	23	157	4	863
		Expected Count	34.7	170.9	148.9	115.5	200.5	36.0	154.4	2.1	863.0
		% within Videos Engagement Level	2.8%	21.0%	17.7%	15.6%	21.6%	2.7%	18.2%	0.5%	100.0%
		% within PRM009	29.3%	44.8%	43.5%	49.5%	39.2%	27.1%	43.0%	80.0%	42.3%
		% of Total	1.2%	8.9%	7.5%	6.6%	9.1%	1.1%	7.7%	0.2%	42.3%
Total		Count	82	404	352	273	474	85	365	5	2040
		Expected Count	82.0	404.0	352.0	273.0	474.0	85.0	365.0	5.0	2040.0
		% within Videos Engagement Level	4.0%	19.8%	17.3%	13.4%	23.2%	4.2%	17.9%	0.2%	100.0%
		% within PRM009	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	4.0%	19.8%	17.3%	13.4%	23.2%	4.2%	17.9%	0.2%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25.552[a]	7	0.001
Likelihood Ratio	26.224	7	0.000
Linear-by-Linear Association	0.180	1	0.671
N of Valid Cases	2040		

a. 2 cells (12.5%) have expected count less than 5. The minimum expected count is 2.12.

Figure 17: watching videos engagement level and Primary Occupation Crosstab and Chi-Square Test

Problems Engagement Level * PRM009

Crosstab

			Primary Occupation								
			0	1	2	3	4	5	6	7	Total
Problems Engagement Level	0	Count	54	209	198	143	265	53	188	1	1111
		Expected Count	44.7	220.0	191.7	148.7	258.1	46.3	198.8	2.7	1111.0
		% within Problems Engagement Level	4.9%	18.8%	17.8%	12.9%	23.9%	4.8%	16.9%	0.1%	100.0%
		% within PRM009	65.9%	51.7%	56.3%	52.4%	55.9%	62.4%	51.5%	20.0%	54.5%
		% of Total	2.6%	10.2%	9.7%	7.0%	13.0%	2.6%	9.2%	0.0%	54.5%
	1	Count	28	195	154	130	209	32	177	4	929
		Expected Count	37.3	184.0	160.3	124.3	215.9	38.7	166.2	2.3	929.0
		% within Problems Engagement Level	3.0%	21.0%	16.6%	14.0%	22.5%	3.4%	19.1%	0.4%	100.0%
		% within PRM009	34.1%	48.3%	43.8%	47.6%	44.1%	37.6%	48.5%	80.0%	45.5%
		% of Total	1.4%	9.6%	7.5%	6.4%	10.2%	1.6%	8.7%	0.2%	45.5%
Total		Count	82	404	352	273	474	85	365	5	2040
		Expected Count	82.0	404.0	352.0	273.0	474.0	85.0	365.0	5.0	2040.0
		% within Problems Engagement Level	4.0%	19.8%	17.3%	13.4%	23.2%	4.2%	17.9%	0.2%	100.0%
		% within PRM009	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	4.0%	19.8%	17.3%	13.4%	23.2%	4.2%	17.9%	0.2%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.647[a]	7	0.081
Likelihood Ratio	12.881	7	0.075
Linear-by-Linear Association	0.577	1	0.448
N of Valid Cases	2040		

a. 2 cells (12.5%) have expected count less than 5. The minimum expected count is 2.28.

Figure 18: solving problems engagement level and Primary Occupation Crosstab and Chi-Square Test

Videos Engagement Level * PRM011A

Crosstab

			PRM011A					
			1	2	3	4	5	Total
Videos Engagement Level	0	Count	7	6	58	418	638	1127
		Expected Count	4.6	6.3	54.2	402.3	659.7	1127.0
		% within Videos Engagement Level	0.6%	0.5%	5.1%	37.1%	56.6%	100.0%
		% within PRM011A	87.5%	54.5 %	61.1%	59.3%	55.2%	57.1%
		% of Total	0.4%	0.3%	2.9%	21.2%	32.3%	57.1%
	1	Count	1	5	37	287	518	848
		Expected Count	3.4	4.7	40.8	302.7	496.3	848.0
		% within Videos Engagement Level	0.1%	0.6%	4.4%	33.8%	61.1%	100.0%
		% within PRM011A	12.5%	45.5 %	38.9%	40.7%	44.8%	42.9%
		% of Total	0.1%	0.3%	1.9%	14.5%	26.2%	42.9%
Total		Count	8	11	95	705	1156	1975
		Expected Count	8.0	11.0	95.0	705.0	1156.0	1975.0
		% within Videos Engagement Level	0.4%	0.6%	4.8%	35.7%	58.5%	100.0%
		% within PRM011A	100.0%	100.0 %	100.0 %	100.0%	100.0%	100.0%
		% of Total	0.4%	0.6%	4.8%	35.7%	58.5%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.753[a]	4	0.150
Likelihood Ratio	7.252	4	0.123
Linear-by-Linear Association	5.001	1	0.025
N of Valid Cases	1975		

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is 3.43.

Figure 19: Video engagement level and sense of achievement of completing MOOC requirements Crosstab and Chi-square Test

Problems Engagement Level * PRM011A

Crosstab

			PRM011A					
			1	2	3	4	5	Total
Problems Engagement Level	0	Count	6	4	54	403	596	1063
		Expected Count	4.3	5.9	51.1	379.5	622.2	1063.0
		% within Problems Engagement Level	0.6%	0.4%	5.1%	37.9%	56.1%	100.0%
		% within PRM011A	75.0%	36.4%	56.8%	57.2%	51.6%	53.8%
		% of Total	0.3%	0.2%	2.7%	20.4%	30.2%	53.8%
	1	Count	2	7	41	302	560	912
		Expected Count	3.7	5.1	43.9	325.5	533.8	912.0
		% within Problems Engagement Level	0.2%	0.8%	4.5%	33.1%	61.4%	100.0%
		% within PRM011A	25.0%	63.6%	43.2%	42.8%	48.4%	46.2%
		% of Total	0.1%	0.4%	2.1%	15.3%	28.4%	46.2%
Total		Count	8	11	95	705	1156	1975
		Expected Count	8.0	11.0	95.0	705.0	1156.0	1975.0
		% within Problems Engagement Level	0.4%	0.6%	4.8%	35.7%	58.5%	100.0%
		% within PRM011A	100.0%	100.0 %	100.0 %	100.0%	100.0%	100.0%
		% of Total	0.4%	0.6%	4.8%	35.7%	58.5%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.694 [a]	4	0.069
Likelihood Ratio	8.791	4	0.067
Linear-by-Linear Association	4.368	1	0.037
N of Valid Cases	1975		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.69.

Figure 20: Solving problems engagement level and sense of achievement of completing MOOC requirements Crosstab and Chi-square Test

Videos Engagement Level * PRM011E

Crosstab

			PRM011E					
			1	2	3	4	5	Total
Videos Engagement Level	0	Count	4	43	284	497	299	1127
		Expected Count	6.3	38.8	265.3	522.7	293.9	1127.0
		% within Videos Engagement Level	0.4%	3.8%	25.2%	44.1%	26.5%	100.0%
		% within PRM011E	36.4%	63.2%	61.1%	54.3%	58.1%	57.1%
		% of Total	0.2%	2.2%	14.4%	25.2%	15.1%	57.1%
	1	Count	7	25	181	419	216	848
		Expected Count	4.7	29.2	199.7	393.3	221.1	848.0
		% within Videos Engagement Level	0.8%	2.9%	21.3%	49.4%	25.5%	100.0%
		% within PRM011E	63.6%	36.8%	38.9%	45.7%	41.9%	42.9%
		% of Total	0.4%	1.3%	9.2%	21.2%	10.9%	42.9%
Total		Count	11	68	465	916	515	1975
		Expected Count	11.0	68.0	465.0	916.0	515.0	1975.0
		% within Videos Engagement Level	0.6%	3.4%	23.5%	46.4%	26.1%	100.0%
		% within PRM011E	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	0.6%	3.4%	23.5%	46.4%	26.1%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	9.187[a]	4	0.057
Likelihood Ratio	9.196	4	0.056
Linear-by-Linear Association	0.692	1	0.406
N of Valid Cases	1975		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 4.72.

Figure 21: Video engagement level and self motivation and self-praise Crosstab and Chi-square Test

Problems Engagement Level * PRM011E

Crosstab

			PRM011E					
			1	2	3	4	5	Total
Problems Engagement Level	0	Count	4	46	276	470	267	1063
		Expected Count	5.9	36.6	250.3	493.0	277.2	1063.0
		% within Problems Engagement Level	0.4%	4.3%	26.0%	44.2%	25.1%	100.0%
		% within PRM011E	36.4%	67.6%	59.4%	51.3%	51.8%	53.8%
		% of Total	0.2%	2.3%	14.0%	23.8%	13.5%	53.8%
	1	Count	7	22	189	446	248	912
		Expected Count	5.1	31.4	214.7	423.0	237.8	912.0
		% within Problems Engagement Level	0.8%	2.4%	20.7%	48.9%	27.2%	100.0%
		% within PRM011E	63.6%	32.4%	40.6%	48.7%	48.2%	46.2%
		% of Total	0.4%	1.1%	9.6%	22.6%	12.6%	46.2%
Total		Count	11	68	465	916	515	1975
		Expected Count	11.0	68.0	465.0	916.0	515.0	1975.0
		% within Problems Engagement Level	0.6%	3.4%	23.5%	46.4%	26.1%	100.0%
		% within PRM011E	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	0.6%	3.4%	23.5%	46.4%	26.1%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.441[a]	4	0.004
Likelihood Ratio	15.632	4	0.004
Linear-by-Linear Association	7.171	1	0.007
N of Valid Cases	1975		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.08.

Figure 22: Solving problems engagement level and self motivation and self-praise Crosstab and Chi-square Test

Videos engagement level * Teaching Presence Perception level

Crosstab

			Teaching Presence Perception level		
			0	1	Total
videos engagement level	0	Count	15	23	38
		Expected Count	18.1	19.9	38.0
		% within videos engagement level	39.5%	60.5%	100.0 %
		% within Teaching Presence Perception level	25.0%	34.8%	30.2%
		% of Total	11.9%	18.3%	30.2%
	1	Count	45	43	88
		Expected Count	41.9	46.1	88.0
		% within videos engagement level	51.1%	48.9%	100.0 %
		% within Teaching Presence Perception level	75.0%	65.2%	69.8%
		% of Total	35.7%	34.1%	69.8%
Total		Count	60	66	126
		Expected Count	60.0	66.0	126.0
		% within videos engagement level	47.6%	52.4%	100.0 %
		% within Teaching Presence Perception level	100.0 %	100.0 %	100.0 %
		% of Total	47.6%	52.4%	100.0 %

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.447[a]	1	0.229		
Continuity Correction[b]	1.017	1	0.313		
Likelihood Ratio	1.457	1	0.227		
Fisher's Exact Test				0.249	0.157
Linear-by-Linear Association	1.436	1	0.231		
N of Valid Cases	126				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.10.

b. Computed only for a 2x2 table

Figure 23: Video engagement level and perception of teaching presence Crosstab and Chi-square Test

Problems solved engagement level * Teaching Presence Perception level

Crosstab

			Teaching Presence Perception level		
			0	1	Total
problems solved engagement level	0	Count	8	11	19
		Expected Count	9.0	10.0	19.0
		% within problems solved engagement level	42.1%	57.9%	100.0 %
		% within Teaching Presence Perception level	13.3%	16.7%	15.1%
		% of Total	6.3%	8.7%	15.1%
	1	Count	52	55	107
		Expected Count	51.0	56.0	107.0
		% within problems solved engagement level	48.6%	51.4%	100.0 %
		% within Teaching Presence Perception level	86.7%	83.3%	84.9%
		% of Total	41.3%	43.7%	84.9%
Total		Count	60	66	126
		Expected Count	60.0	66.0	126.0
		% within problems solved engagement level	47.6%	52.4%	100.0 %
		% within Teaching Presence Perception level	100.0%	100.0%	100.0 %
		% of Total	47.6%	52.4%	100.0 %

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.273[a]	1	0.602		
Continuity Correction[b]	0.075	1	0.785		
Likelihood Ratio	0.274	1	0.601		
Fisher's Exact Test				0.628	0.394
Linear-by-Linear Association	0.271	1	0.603		
N of Valid Cases	126				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.05.

b. Computed only for a 2x2 table

Figure 24: Solving problems engagement level and perception of teaching presence Crosstab and Chi-square Test

Videos engagement level * Social Presence Perception level

Crosstab

			Social Presence Perception level		
			0	1	Total
videos engagement level	0	Count	20	18	38
		Expected Count	23.5	14.5	38.0
		% within videos engagement level	52.6%	47.4%	100.0%
		% within Social Presence Perception level	25.6%	37.5%	30.2%
		% of Total	15.9%	14.3%	30.2%
	1	Count	58	30	88
		Expected Count	54.5	33.5	88.0
		% within videos engagement level	65.9%	34.1%	100.0%
		% within Social Presence Perception level	74.4%	62.5%	69.8%
		% of Total	46.0%	23.8%	69.8%
Total		Count	78	48	126
		Expected Count	78.0	48.0	126.0
		% within videos engagement level	61.9%	38.1%	100.0%
		% within Social Presence Perception level	100.0%	100.0%	100.0%
		% of Total	61.9%	38.1%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.984[a]	1	0.159		
Continuity Correction[b]	1.461	1	0.227		
Likelihood Ratio	1.959	1	0.162		
Fisher's Exact Test				0.168	0.114
Linear-by-Linear Association	1.968	1	0.161		
N of Valid Cases	126				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.48.

b. Computed only for a 2x2 table

Figure 25: Video engagement level and perception of social presence Crosstab and Chi-square Test

Problems solved engagement level * Social Presence Perception level Crosstab

			Social Presence Perception level		
			0	1	Total
problems solved engagement level	0	Count	10	9	19
		Expected Count	11.8	7.2	19.0
		% within problems solved engagement level	52.6%	47.4%	100.0%
		% within Social Presence Perception level	12.8%	18.8%	15.1%
		% of Total	7.9%	7.1%	15.1%
	1	Count	68	39	107
		Expected Count	66.2	40.8	107.0
		% within problems solved engagement level	63.6%	36.4%	100.0%
		% within Social Presence Perception level	87.2%	81.3%	84.9%
		% of Total	54.0%	31.0%	84.9%
Total		Count	78	48	126
		Expected Count	78.0	48.0	126.0
		% within problems solved engagement level	61.9%	38.1%	100.0%
		% within Social Presence Perception level	100.0 %	100.0%	100.0%
		% of Total	61.9%	38.1%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.816[a]	1	0.366		
Continuity Correction[b]	0.418	1	0.518		
Likelihood Ratio	0.800	1	0.371		
Fisher's Exact Test				0.444	0.257
Linear-by-Linear Association	0.809	1	0.368		
N of Valid Cases	126				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.24.

b. Computed only for a 2x2 table

Figure 26: Solving problems engagement level and perception of social presence Crosstab and Chi-square Test

videos engagement level * Cognitive Presence Perception level

Crosstab

			Cognitive Presence Perception level		
			0	1	Total
videos engagement level	0	Count	14	24	38
		Expected Count	18.1	19.9	38.0
		% within videos engagement level	36.8%	63.2%	100.0%
		% within Cognitive Presence Perception level	23.3%	36.4%	30.2%
		% of Total	11.1%	19.0%	30.2%
	1	Count	46	42	88
		Expected Count	41.9	46.1	88.0
		% within videos engagement level	52.3%	47.7%	100.0%
		% within Cognitive Presence Perception level	76.7%	63.6%	69.8%
		% of Total	36.5%	33.3%	69.8%
Total		Count	60	66	126
		Expected Count	60.0	66.0	126.0
		% within videos engagement level	47.6%	52.4%	100.0%
		% within Cognitive Presence Perception level	100.0%	100.0 %	100.0%
		% of Total	47.6%	52.4%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.533[a]	1	0.111		
Continuity Correction[b]	1.953	1	0.162		
Likelihood Ratio	2.559	1	0.110		
Fisher's Exact Test				0.124	0.081
Linear-by-Linear Association	2.513	1	0.113		
N of Valid Cases	126				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.10.

b. Computed only for a 2x2 table

Figure 27: Video engagement level and perception of cognitive presence Crosstab and Chi-square Test

problems solved engagement level * Cognitive Presence Perception level Crosstab

			Cognitive Presence Perception level		
			0	1	Total
problems solved engagement level	0	Count	7	12	19
		Expected Count	9.0	10.0	19.0
		% within problems solved engagement level	36.8%	63.2%	100.0%
		% within Cognitive Presence Perception level	11.7%	18.2%	15.1%
		% of Total	5.6%	9.5%	15.1%
	1	Count	53	54	107
		Expected Count	51.0	56.0	107.0
		% within problems solved engagement level	49.5%	50.5%	100.0%
		% within Cognitive Presence Perception level	88.3%	81.8%	84.9%
		% of Total	42.1%	42.9%	84.9%
Total		Count	60	66	126
		Expected Count	60.0	66.0	126.0
		% within problems solved engagement level	47.6%	52.4%	100.0%
		% within Cognitive Presence Perception level	100.0%	100.0%	100.0%
		% of Total	47.6%	52.4%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.042[a]	1	0.307		
Continuity Correction[b]	0.595	1	0.440		
Likelihood Ratio	1.055	1	0.304		
Fisher's Exact Test				0.332	0.221
Linear-by-Linear Association	1.034	1	0.309		
N of Valid Cases	126				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.05.

b. Computed only for a 2x2 table

Figure 28: Solving problems engagement level and perception of cognitive presence Crosstab and Chi-square Test

Appendix E: All Codebooks
Codebook Pre MOOC Survey

Question Text in Arabic	Answer Text in Arabic	Question Text in English	Answer Text in English	Code
ما هو هدفك بالنسبة لإكمال متطلبات هذا المساق؟		What is your goal regarding completing the requirements of the MOOC?		PRM001
	الالتزام بإكمال جميع متطلبات المساق للحصول على شهادة إتمام المساق		Committed to completing all requirement of the MOOCs to obtain the MOOC completion certificate	1
	الاستفادة من المحتوى المقدم حول موضوع المساق دون الالتزام بالحصول على شهادة الإتمام		To benefit from the content offered around the MOOC subject without commitment to obtain the MOOC completion certificate	2
	لم أقرر درجة الالتزام بعد		Haven't decided the level of commitment yet	3
	التعرف على المساقات الإلكترونية الجماعية المفتوحة المصادر و تجربتها دون الالتزام بالحصول على شهادة إتمام		To know about MOOCs and trying them without committing to obtain a certificate of completion	4
(ما دافعك الأساسي من الالتحاق بالمساق؟ (اختر كل ما ينطبق		What is your primary motivation for enrolling in the MOOC? (Choose all that apply)		PRM002

	لزيادة فرصتي للحصول على فرصة وظيفية أو دراسية		To increase my chance of getting an educational or employment opportunity	1
	هذا المساق مفيد لوظيفتي أو دراستي الحالية		This MOOC is beneficial for my current job or studies	2
	لمعلوماتي الشخصية		For my personal information	4
	للتعرف على متعلمين آخرين لهم نفس اهتماماتي		To meet other learners with my same interests	8
ما مدى معرفتك في مجال المساق؟		How much do you know about the subject of the MOOC?		PRM003
	خبرتي المهنية في نفس المجال		My work experience is in the same field	1
	أنا طالب جامعي حاليا في نفس المجال		I am a currently a university student in the same field	2
	حاصل على شهادة جامعية (بكالوريوس، ماجستير،دكتوراة) في نفس المجال		I have a university certificate (Bachelors, Masters, Doctorate) in the same field	3
	أقرأ الكثير عن هذا المجال		I read a lot about this field	4
	لا يوجد لدي معرفة عن هذا المجال		I don’t have any knowledge about this field	5
ما هي طبيعة عملك؟ (ممكن تحديد أكثر من خيار)		What is the nature of your job (Choose all that apply)		PRM004

	طالب في مجال التسويق		Student in Marketing	1
	طالب في مجال التسويق الإلكتروني		Student in E-Marketing	2
	أعمل في مجال التسويق		I work in Marketing	4
	أعمل في مجال التسويق الإلكتروني		I work in E-Marketing	8
	غير ذلك (الرجاء ذكر المجال)		Other (removed open ended responses so *other* will count as such)	16
هل سبق لك الالتحاق بمساق تعليمي إلكتروني مفتوح؟		Have you ever enrolled in an open educational MOOC before?		PRM005
	نعم		Yes	1
	لا		No	2
ما هي لغتك الأساسية التي تحب التعلم بها ؟		What is your primary language of preference for learning?		PRM006
	اللغة العربية		Arabic	1
	اللغة الانجليزية		English	2
	اللغة الفرنسية		French	3
	لغة أخرى		Other	4
ما هي الفئة العمرية التي تنتمي اليها؟		What is your age group?		PRM007
	أقل من 18 سنة		Less than 18 years	1
	ما بين 18 و 25 سنة		Between 18 and 25 years	2
	ما بين 25 و35 سنة		Between 25 and 35 years	3

	ما بين 35 و 45 سنة		Between 35 and 45 years	4
	أكثر من 45 سنة		More than 45 years	5
ما هي وظيفتك الأساسية؟		What is your primary occupation?		PRM008
	أعمل بشكل كامل		I work full time	1
	عمل عن طريق عقد، أو عمل حر		Contractor or Freelancer	2
	أعمل لحسابي الخاص		Private business	3
	طالب جامعي		University student	4
	طالب مدرسة ثانوية		High school student	5
	لا أعمل		Unemployed	6
	متقاعد		Retired	7
أعلى مستوى تعليمي وصلت إليه؟		What is the highest educational level you reached?		PRM009
	أقل من الثانوية		Less than high school	1
	مدرسة ثانوية		High school	2
	شهادة مهنية		Technical/professional Certificate	3
	درجة البكالوريوس		Bachelor's Degree	4
	درجة الماجستير أو أعلى		Master's Degree or Higher	5
	دبلوم		Diploma	6
النوع؟		Gender		PRM010
	ذكر		Male	1

	أنثى		Female	2
استكمال واجبات ومتطلبات المساق يعطيني شعورا بالإنجاز		Completing the required assignments and MOOC requirements gives me a sense of achievement		PRM011A
من المهم بالنسبة لي التعبير عن آرائي دون الشعور بالإحراج		It’s important for me to express my opinions without feeling embarrassed		PRM011B
أنا أتعلم من أجل التُعلم والاستمتاع بالعلم		I learn for the sake of learning and enjoyment of learning		PRM011C
من المهم بالنسبة لي تلقي تقييم المحاضر لأدائي الأكاديمي على مدار فترة المساق		It’s important for me to receive instructor feedback for my academic performance throughout the MOOC duration		PRM011D
في حالة غياب تقييم المحاضر ، أقوم بالتحفيز الذاتي والثناء على ما أقوم به بشكل جيد		In the absence of instructor feedback, I self motivate and praise myself on what I do well		PRM011E
من المهم بالنسبة لي معرفة درجاتي بشكل مستمر على مدار فترة المساق		It is important for me to know my grades consistently throughout the MOOC duration		PRM011F
	أوافق بشدة		Strongly Agree	5
	أوافق		Agree	4

	محايد		Neutral	3
	لا أوافق		Disagree	2
	لا أوافق بشدة		Strongly Disagree	1

Codebook Pre MOOC Survey 'Select All that Apply' responses

Codebook for Questions with 4 answers				
	Option 1	Option 2	Option 3	Option 4
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Codebook for Questions with 5 answers

	Option 1	Option 2	Option 3	Option 4	Option 5
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
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Appendix F: Consent Form

Both English and Arabic translation of consent form received IRB approval. Arabic translation of the consent form was approved by CAPMAS, and was the one administered in the research study on the Edraak platform.

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

Documentation of Informed Consent for Participation in Research Study

Project Title: Learner Engagement in a MOOC in the Arab World: A Case Study Analysis Using the Community of Inquiry Framework

Principal Investigator: Nadine Aboulmagd - Nadinne@aucegypt.edu - 02 +0226153794

You are being asked to participate in a research study. The purpose of the research is to explore the factors that affect learner engagement in MOOCs in the Arab World by mapping out the learners' perceptions of teacher, cognitive and social presences with their engagement level. The findings may be *published, presented, or both* for research and education purposes. The expected duration of your participation is 15 minutes to 30 minutes, depending on the level of your participation; survey (15 minutes) and interview (15 minutes).

The procedures of the research will be as follows: the researcher will gather data on student engagement from learning analytics provided by Edraak during the MOOC, the researcher will share a survey with the learners in the final week of the MOOC and finally the researcher will ask willing participants for a short interview about their learning experience in the MOOC.

There *will not be* any risks or a discomfort associated with this research and participation in the survey and/or interviews.

The information you provide for purposes of this research will be confidential. The data will be kept in the possession of the researcher for the duration of the research and analysis. Once the thesis research is published, the data will be destroyed.

Questions about the research, your participation in this study or your rights should be directed to Nadine Aboulmagd at Nadinne@aucegypt.edu or +20226153794.

Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or the loss of benefits to which you are otherwise entitled.

Signature _____

Printed Name _____

Date _____

Appendix G: IRB Approval

CASE #2017-2018-030

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

To: Nadine Aboulmagd

Cc: Dena Riad & Salma Serry

From: Atta Gebril, Chair of the IRB

Date: Oct. 26, 2017

Re: Approval of study

This is to inform you that I reviewed your research proposal entitled "**Learner Engagement in a MOOC in the Arab World: A Case Study Analysis Using the Community of Inquiry Framework**" and determined that it required consultation with the IRB under the "expedited" heading. The proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants.

This approval letter was issued under the assumption that you have not started data collection for your research project. Any data collected before receiving this letter could not be used since this is a violation of the IRB policy.

Please note that IRB approval does not automatically ensure approval by CAPMAS, an Egyptian government agency responsible for approving some types of off-campus research. CAPMAS issues are handled at AUC by the office of the University Counsellor, Dr. Ashraf Hatem. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a year, you need to apply for an extension.

Thank you and good luck.

Dr. Atta Gebril
IRB chair, The American University in Cairo
2046 HUSS Building
T: 02-26151919
Email: agebril@aucegypt.edu

Institutional Review Board
The American University in Cairo
AUC Avenue, P.O. Box 74
New Cairo 11835, Egypt.
tel 20.2.2615.1000
fax 20.2.27957565
Email: aucirb@aucegypt.edu

Appendix H: CAPMAS Approval

الجهاز المركزى للتعبئة العامة والإحصاء

القيـــد : ٢٧٤

التاريـــخ : ٢١/ ١٠ / ٢٠١٧

الموضوع : ----------

المرفقات : ----------

الـسـيد الأسـتاذ الـدكـتـور / مستشار الجامعة الامريكية بالقاهرة

تحيـة طيبـة وبعد ،،،

بـالإشـارة لـكـتـاب سـيـادتـكم الـوارد للـجهـاز فـي ٢٩/ ١٠ /٢٠١٧ بشـأن طلب الموافقة علـي قـيـام الـبـاحـثـة / نـادين خـالـد عـبد المعبود أبـو المجد ـ المسجلـة لدرجة الماجستيرالأداب فى التربية القيادة الـتـربـويـة / الجامعـة الأمريكيـة بـالـقـاهرة - بإجـراء دراسـة ميدانيـة بـعـنـوان : (تفاعل المتعلم فـى مـسـاق فـى الـعـالـم الـعـربـى تـحـلـيـل دراسـة حـالـة بإسـتـخـدام إطـار التحقيـق المجتمعى).

وذلك وفقا للإطار المعد لهذا الغرض.

يـرجـى الـتـكرم بالإحاطـة بـأن الجـهـاز الـمـركـزي للـتـعبـئـة العامـة والإحـصـاء يوافق على قيام الـبـاحثـة / نـادين خـالـد أبـو المجـد - بـإجـراء الـدراسـة الـمـيدانيـة المشـار إليها بعالية وفقا للـقرار رقم (٧٢٣) لسنة ٢٠١٧ اللازم في هذا الشأن وعلى إن يـوافى الجهـاز بنسخة من النـتـائـج الـنـهـائـيـة كـامـلـة فـورالانـتـهـاء مـن إعـدادهـا طـبـقـا للـمـادة رقـم (٦) مـن الـقـرار

وتفضلوا بقبول فائق الاحترام ،،،

محمد ممدوح محمد ١٠/٢٩

مدير عام الإدارة العامة للأمن