

Examining the Impact of Social Media Engagement on Students' Motivation in MOOCs

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requirements of the University of Greenwich for the
degree of Doctor of Philosophy

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DECLARATION

‘I certify that the work contained in this thesis, or any part of it, has not been accepted in substance for any previous degree awarded to me or any other person, and is not concurrently being submitted for any other degree other than that of (Doctor of Philosophy) which has been studied at the university of Greenwich, London, UK.

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ABSTRACT

The rapid development of Massive Online Open Courses (MOOCs) has attracted significant attention. Despite the publicity, one of the major problems is the high dropout of MOOC learners. Many MOOCs attract thousands of learners; thus, it is inevitable that they will have diverse motivations for studying. Therefore, it is important that MOOC instructors design courses that can address varieties of motivations to sustain online learning. The emergence, and widespread use of social media presents MOOC designers with opportunities to use social media to improve interactions. However, there are only few researches on how these engagements on social media affect learners' motivation and retention in MOOCs. This research aims to close these gaps and answer the question "*What is the impact of social media engagement on learners' motivation in MOOCs?*" Mixed methods approaches were used in the study, gathering data via the course platform, questionnaires, social media forum posts and a focus group study on the mobile messenger app, WhatsApp. The research used a MOOC entitled "Entrepreneurship and Innovation" that had been previously offered by the University of Greenwich, London. This was significantly redesigned and bore little relationship to the new version of the same name which ran for five weeks on the Canvas Network platform. The redesigned MOOC used three social media groups. These were advertised on the course platform and students who consented, registered on either Facebook, Google Hangout via webpage links. Those interested in WhatsApp were given a mobile number to join. At the end of the MOOC, the statistical analysis showed that of the 450 students who registered for the MOOC, 289 (64%) participants started the course, and 161 (35.8%) did not start the course; 94 (32.5%) participated in the social media platforms; 195 (67.5%) did not participate in social media and engaged solely via the Canvas platform. The results show that 92.5% of those who engaged in social media started the course while 70.7% who did not engage in social media, started. Completion rate was 24.5% in social media learners and 10.8% in non-social media learners. The qualitative data was subjected to thematic analyses. The qualitative results and the focus group study further revealed that engagement with social media motivated learners to start the course, network, share information, and obtain quick responses. However, others complained of distractions. Thus, this study provides statistical evidence, which shows that using social media to engage MOOC students before the course starts, could enhance course start-up and positively impact on course engagement, retention and completion.

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ABBREVIATIONS

MOOC: Massive Open Online Courses

cMOOC: Connectivist MOOC

xMOOC: Instructivist MOOC.

SM: Social Media

NSM: Non-Social Media

VLE: Virtual Learning Environment

ICT: Information and Communication Technologies

LMS: Learning Management System

CHAPTER 1

INTRODUCTION

This chapter offers a summary of the motivation and research scope. It describes the aim and objectives of this study. Subsequently, it also describes the thesis structure and publication from the research.

1.1 Motivation and Research Scope

Massive Open Online Courses (MOOCs) typically offer individuals an opportunity to learn for free, and in some cases, fees are charged (MOOC, 2018). MOOC participants can develop their learning without any obligation or other requirements (Barak, Watted and Haick, 2016). In spite of the advantages of MOOCs, academic literature and media have consistently raised the issue of the high rate of learners' drop out (Ripiye et al., 2016; Yang 2015; Onah et al., 2014). Although thousands of students enroll in these courses, the rate of completion (defined as the percentage of enrolled and completed) ranges from 0.7% to 52.1%, the value of the median is 12.6 % (Jordan, 2014). Jordan further reports that in achieving students' engagement, the first and second weeks are critical. Afterwards, the proportion of active students, and those that submitted assessments, dropped - the differences was less than 3% between the end of week two and succeeding weeks (Jordan, 2015). Reports have also indicated that in the situation of MOOCs, a low completion rate may not be essentially harmful (Pardos et al., 2013; Kizilcec, Piech and Schneider, 2013; Veeramachaneni et al., 2013). The reason is that varied motivations and goals could be experienced by those who register for the same course in MOOCs (Wang, 2014). Anderson (2013) stressed that several MOOC participants sign up for courses with no purpose of completing the course instead only to satisfy their initial curiosity.

However, there is insufficient information about the motivation of students who complete online courses (Onah, Sinclair and Boyatt, 2014). The fact that MOOCs are gaining popularity worldwide shows there is a need to further study learners' motivation from various aspects (Barak 2016; Barak, Watted and Haick 2016; Kizilcec and Schneider 2015; Sinha, 2014).

As retention issues are drawing attention in MOOC research, many researchers are now focusing on this subject (Ripiye et al., 2017; Jordan, 2015; Bacon et al., 2015). Most studies have also shown that there is a need for a high level of motivation for the completion of distance

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learning programs, including MOOCs (Khalil and Ebner, 2014; Knowles and Kerkman, 2007). Consequently, many MOOC instructors are now looking for ways to encourage high levels of motivation in their students and to determine what motivates them to learn (Murray, 2013). Presently, most MOOC platforms only provide educational videos, discussion forums, and send announcements – the support for the use of social media is scarce (Saijing et al., 2016). To solve this problem, some MOOC instructors are refocusing their efforts to cultivate active learning environments (Fidalgo et al., 2014; Ventura et al., 2014). Furthermore, it was reported that incorporating a variety of external tools, such as Google Plus, Facebook, Twitter, etc. could help to network and motivate students (Sharma and Sharma, 2018).

However, current research lacks comprehensive studies on how social media usage influences learners' motivation and the effect of such motivation on MOOC engagement, retention, and completion. Therefore, identifying innovative ways of improving motivation is imperative. Insights from this could offer greater detailed understanding and knowledge of the effect of social media engagement on students' motivation in MOOCs. Identifying social media usage in a manner that supports engagement and retention in MOOCs is very important. It is of considerable importance and is the problem that this research intends to address.

1.2 Initial Aim and Objectives of the Research

The study aims to find out if the incorporation of social media alongside a MOOC can have an impact on learners' motivation, course engagement, and retention. Consequently, the research aims to develop the following proposed research objectives:

- (a) To determine if early engagement with social media before the course begins will increase the number of students who start the MOOC from those who have registered.
- (b) To examine how engagement with social media affects learners' motivation within a MOOC.
- (c) To find out if there are differences in course engagement, retention, and completion rate between learners who engage in social media and those who did not.

1.3 Initial Research Question

The study developed its focus out of the initial background literature and research. The aim is to answer the following research question.

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1.4 Initial Research Question.

“Can engagement with Social Media as a support interface within a MOOC affect a learner’s motivation?”

1.4 Methodology and Thesis Structure

The methodology is described in this section, its justification, thesis structure and how it meets the research goals. The thesis comprises seven chapters, as follows:

Chapter 2 provides an outline of the study background information and discusses the definition of the research question grounded on the review of literature.

Chapter 3 describes the research methodology.

Chapter 4 deliberates the experimental design of the study.

Chapter 5 discusses the MOOC’s pre-course, course period phases and social media engagement during the MOOC.

Chapter 6 presents the analysis of data, the statistical outcomes, and discusses the findings.

Chapter 7 discusses some of the achievements at the completion of the research. It summarises the research by examining, revisiting the study, discussing its contributions to research, limits, and future directions.

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1.5 Publications Related To This Thesis

1. Rippiye, P.; Bacon, L.; Mackinnon L.; Walker, S. (2018). The role of social media in motivating students in a Pre- connectivist MOOC. ICEL 2018. *13th International Conference on eLearning*. Cape Town, South Africa.
2. Rippiye, P.; Bacon, L.; Mackinnon L.; Walker, S. (2017). The Use of Social Media in MOOCs: A Review of Literature. *4th European Conference on Social Media (ECSM 2017)* Vilnius, Lithuania.
3. Rippiye, P.; Bacon L.; Mackinnon L.; Walker, S. (2016). Examining the impacts of social media on students' motivation in MOOCs. ECEL 2016 - *Proceedings of the 15th European Conference on eLearning*. Prague, Czechoslovakia.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter explains the recent research in the area of study, to refine the research question developed in Chapter 1. First, a brief history of MOOCs, their taxonomy, the pedagogical concept, learning theories, issues and challenges concerning MOOCs are examined. Social networking and web 2.0 technologies, their uses, impact on learning, and challenges of incorporating them in online learning, including MOOCs, are discussed. The chapter continues with the presentation and review of students' engagement online and in MOOCs, and methods of measuring students' engagement are discussed. The chapter finishes with a detailed dialogue concerning students' behaviour in an online learning environment, motivation and their impact on engagement and retention, which is the focus of this research.

2.2 Massive Open Online Course

Over the years, an outburst of media and public attention have been experienced in open and distributed learning mostly focussed on the use of the Massive Open Online Courses (MOOCs) phenomenon (Anders, 2015). Additionally, Anders (2015) reported that the term MOOC had in so many ways been used to define varieties of set of methods and reasons for offering learning online practises that are massive. Besides, Knox (2014) discusses the ideas of the Open Educational Resources Movement (OERM), supporting free availability to learning materials, research, teaching and how these illustrates the Massive Online Open Courses (MOOCs) pedagogical design. Andersen and Ponti (2014) define a MOOC as a planned and organized Open Educational Resources (OER) in a course form with educators or organizers participating. The delivery of MOOCs has been through the use of platforms that are centralised and services offered comprising learning management systems (LMSs) and networks that are decentralised networks grounded on sometimes with combinations of social media feeds and blog sites (Anders, 2015). Additionally, Anders reported that MOOCs is meant to support university curricula, professional development, corporate training applications, community outreach and academic scholarship.

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2.3 History of MOOCs.

In 2008, the course developed by Stephen Downes and George Siemens entitled connectivism and connective knowledge was referred to as MOOC (Bates, 2014). Their objective initially was to explore the prospect for collaborations between learners' participants' diversities, which were possible or achievable through online tools to offer an enhanced environment of learning than traditional tools. At the University of Manitoba campus, twenty-five students joined the course and 2300 participated online worldwide (McGill, 2018). This step led to the concept of the MOOC with an emphasis on interaction and connectivity. These types of courses are known as connectivist MOOCs (Daniel, 2012; deWaard, 2011; Siemens, 2013).

Markoff (2011), further reported another MOOC experiment that drew academics' attention, offered, by two Stanford Professors, Sebastian Thrun and Peter Norvig, entitled "*Introduction to Artificial Intelligence*". Its design resembled the experience of studying in an actual classroom and provide high-quality learning materials for everyone (Markoff, 2011). The instructors including assignments, and exams provided the learning materials and the idea had the advantage of carrying the prominent Stanford name and this led Thrun and Norvig to design the Udacity start-up (Markoff, 2011). Within one to two years, Coursera and edX were launched (Lawton and Katsomitros, 2013). The Open University in 2013 developed FutureLearn, which featured universities from the United Kingdom. Additional autonomous MOOC initiatives are developing, including iversity in Germany and Open2Study in Australia (Pnpi, 2015). According to Lowendahl et al. (2016) by 2012, MOOCs, as described by Gartner's hype cycle, had tilted over the top of exaggerated opportunities and crashed into the trench of dissatisfaction in 2013 and 2014, but in 2015 started to climb the slope of enlightenment. Pappano (2012) also reported that the Year of the MOOC was 2012, which comprised the start-up of MOOC providers like edX, Udacity and Coursera.

Additionally, Pappano explained that these start-ups were indicated as innovations that would decrease costs of university education and increase access. Nevertheless, by 2013 and 2014, there was a full swing of anti-MOOC criticism. MOOCs critics cited a combination of low completion rates and high cost of development although the demographic data presented that majority of MOOC learners were professional and highly educated (Fischer, 2014; Hill, 2013;

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Selingo, 2014). Still some initial prospects of MOOCs, such as increased access and decrease in the costs of university education had proven impractical, Anders (2015); Pappano, (2012) explained that MOOCs were a maturing technological innovation.

Jansen and Konings (2018) report it acknowledged that United States embraced MOOCs faster than Europe. Eventually the interest level developed speedily with the initiation of the OpenUpEd gateway and numerous financed European developments of the FutureLearn platform (UK based) (Jansen and Konings, 2018). Also, Brown (2017) also reported that during this period of MOOC development most MOOCs were available in English. For instance, the FUN MOOC platform in France registered more than one million learners and had developed nearly 500 courses. Open2Study in Australia which is managed by Open Universities Australia (OUA) has over a million learners and provides above 50 courses (Brown, 2017). Other countries like India, Indonesia, China, Mexico, India and Russia also used the edX platform to develop courses with some platform in Arabic aiding the Middle East (Brown, 2017). For instance, according to Shah (2014), year-end statistics for 2014 presented a speedily growing MOOC market which has almost 18 million students include over 400 universities offering over 2400 courses. Examples are MiriadaX, a platform that delivers courses to Spanish speakers, which had in 2014 1 million users (Anders, 2015). Likewise, Canvas Network (USA based), providers in European like iversity and FutureLearn and Open2Study, the Australian provider are rising in market share, as many MOOCs are offered independently by other universities and institutions (Shah, 2014). Also supplementing this enormous variety of MOOC stakeholders and practitioners is the increasing incorporation of research in MOOC literature of open, distant, and distributed learning (Anders, 2015).

MOOCs are defined by four principles as follows:

Massive. According to Moe (2014), for a massive course, it must be open to a substantial student's number and learning resources, assessments and results in a manner in which the learner all gets related understanding. Additionally, Moe (2014) reported that the usage of the expression 'significant' to define the size of the class is contentious; numerous hundred learners may be 'significant' in one context, additionally might entail thousands of learners to be 'significant'. It is these scalability issues according to Helquist (2013) that are one of the primary

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benefits of MOOCs, which have two key assumptions at their core: (1) individual learners can adapt to the instructional experience to their needs, (2) that present technologies used in MOOCs are robust and scalable.

Open. According to Moe (2015), Open denotes the prospect for students to enrol in the course free (even though many MOOCs now charge fees for the certificate). Furthermore, Moe noted that there is a dispute in the definition of open in scholarly debate. The MOOCs innovate works originated from the Open Educational Resources (OER) movement, where monetary cost nullified the learning materials and course content were separated or removed from prevailing ownership and released as global, unrestricted and reusable in the creative commons (Downes, 2013).

In addition, according to OpenupEd (2015.p2) “open” denotes that the “*course can be accessed by (almost) anyone anywhere as long as they have an internet connection*”. However, it further explained that these standards could not be seen as complete (OpenupEd, 2015.p2).

Also, OpenupEd (2015) explained “open” as in liberty of place, time and space. However, they noted that most MOOCs nowadays have both self-paced, and a fixed start and end dates. Therefore, a fixed start date and end date are not measured as an evident criterion to differentiate between other courses and MOOCs (Fisher, 2014). In addition, Fisher (2014) reported that the advantages of a self-paced course are most apparent in the flexibility it affords a student on their own schedule can work their way through the course, along the way, taking educational changes, as they see fits.

Online. This denotes that the measures used are that which entails that all features of course and activity should be provided online all though, in some cases, students on their own organise meet-ups (OpenupEd, 2015). In the case of MOOCs, each section of the course a student believes to be desirable for active completion is retained online e.g. Lectures, assignments, communication, additional materials and valuation (Moe, 2015). Some MOOCs according to Moe (2015) encourages students to form study groups with social media (Fidalgo et al., 2014; Ventura et al., 2014) or to develop face-to-face groups around geographical locations (Alario-Hoyos et al., 2013). MOOC creativities in recent have work together to proffer prospects for students to have face to face access to students and teachers at existing higher education institutions. For example, Caulfield et al., (2013) reported the research of Patti Ordonez-Rozo,

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who incorporated her conventional classroom in spring 2012 with Stanford's introduction to databases MOOC for students group consisting of 26 students at the University of Puerto Rico, Rio Perdras. To stress the importance of these meetups, Goldberg (2015) reported that drive in the world of MOOC has started to host meetup locally. The importance of social learning was noted in the speech by Goldberg (2015p.1) in his article "*MOOCs and Meetups together make a better learning*" quoted Dhawal Shah, CEO of MOOC review aggregator Class Central which stated that.

"MOOCs have unbundled courses from universities in a way that scales top-quality, affordable learning experiences to willing students across the world...but one thing they do not provide is in-person interaction, which can be critical for many students and types of courses" (Goldberg, 2015p1)

However, Moe (2014) noted that these elements are not essential for a student to succeed and further reported that there are incidences where MOOCs students were required to purchase textbooks.

Course. The course is often used to indicate the registering and relationship with the instructional group, and existence of the course's time and space (Moe, 2015). Additionally, Moe (2015) explains that a course entails registration of the instructional group and a selected time over a period. In addition, Milligan et al., (2014) stated that in online courses; factors affecting self-regulated learning are well documented and includes self-efficacy, collaboration with other people and task strategies. In conclusion, Milligan and Littlejohn (2014) reported that not much is known about the approaches needed for effective self-regulated learning in MOOCs.

OpenupEd (2015) defined MOOC courses as offering a complete course involvement covering:

1. Educational content
2. Facilitation of peer collaborations
3. Task/Actions, tests, comprising a feedback
4. Non- formal recognition choices
5. A study syllabus /guide.

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Furthermore, OpenupEd (2015) and Bates (2014) provided a set of criteria for a MOOC as:

- (a) Educational content may contain video, games, text and audio.
- (b) Offers prospects for interaction like, forums, social media, blog, channels and forums.
- (c) A feedback mechanism is provided for participants. Automatically it generates quizzes, peer comment and response from academic staff etc.
- (d) Reward - on completion certificate or badges are given - an official certificate is optional and some occasions students pay for it. Syllabus comprises instructions as to how one may learn from the presented interactions and course materials.

2.4. Type of MOOCs

2.4.1 cMOOCs and xMOOCs

MOOCs are driven in two unique pedagogical directions due to ideological conflict. The (cMOOC) connectivist MOOCs are grounded on the connectivism theory of learning (Siemens, 2004). It places substantial importance on informal networking, social interaction and robust contributions of content from the participants. A distinctive example of a cMOOCs platform is the Graasp Personal Learning Environment (Gillet, 2013). The platform is incorporated with built-in social media features to increase opportunistic collaboration and informal interactions between students (Gillet, 2013). The content-based MOOCs (xMOOCs) trail a more instructivist style and are connected frequently with the providers' Udacity, edX, Coursera and Canvas network. The UK's FutureLearn is also in this group (Bis, 2013; Yuan and Powell, 2013).

Varied principles have focused MOOCs in two distinctive pedagogical guidelines as Li and Powell, (2013.p7) report, citing for this narrative:

"cMOOCs emphasize connected, collaborative learning and the courses are built around a group of like-minded individuals' platform to explore new pedagogies beyond traditional classroom settings and, as such, tend to exist on the radical fringe of Higher Education. On the other hand, the instructional model (xMOOCs) is essentially an extension of the pedagogical models practiced within the institutions themselves, which is arguably dominated by the "drill and grill" instructional methods with video presentations, short quizzes and testing".

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2.4.2. xMOOCs

Bates (2014); Kesim and Altinpulluk (2015) offers a summary of the overall of xMOOCs features, which have the resulting shared feature designs:

(i) Specially designed platform software: In xMOOCs, the platform software is particularly designed and allows registration of huge numbers of participants, offers streaming facilities, storing of digital materials, and student's performance tracking and automates assessment actions.

(ii) Computer-marked assessments: Students finish the test online and obtain instant computerised response.

(iii) Peer assessment: In some xMOOCs, students are assigned to randomly construct peer assessment for a small group, especially for evaluative assignments or open-ended questions (Seun, 2014). Additionally, Bates explained that because of the diverse participation level in the course with various learners, this has often showed challenging because of varied variances in knowledge among the diverse group members. Numerous approaches are now accessible to develop the precision of peer assessment outcomes. For instance, O'Toole (2013) has described six models for meaningful pedagogical peer-assessment:

- Peer grading
- Mantle of expert
- Micro feedback and rating of a student's contribution
- Students assessing students in teaching threshold concepts
- Multiple critical perspectives
- Peer-assessment of applying shared knowledge in diverse contexts

(iv) Other characteristics of xMOOCs also includes a shared comment/discussion space, discussion moderation which is focussed at all participants rather than to individuals, award of Badges/certificates, degrees and ability to have learning analytics (Bates, 2014, Onah, Sinclair and Boyatt, 2014), other's comments and questions (Onah, Sinclair and Boyatt, 2014b; Bates, 2014).

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2.4.3 cMOOCs:

cMOOCs vary in terms of educational viewpoint from xMOOCs, for the fact that cMOOCs stress is intensely on interacting and specifically emphasis on contributing content from the MOOC learners (Bates, 2014; Kesim and Altınpulluk, 2015). Downes (2012) acknowledge four crucial design ideologies for cMOOCs:

- The learners' autonomy: In this case, there is no formal curriculum. Learners have a choice on the content they learn thus personalising learning.
- Diversity: concerning diverse participants and their level of knowledge and diverse content.
- Interactivity: relates to collective learning, interaction between participants, which result to knowledge development.
- Open-ness: in relation to access, activities, assessment and content.

Furthermore, (Bates, 2014; Kesim and Altınpulluk, 2015) also define the vital practices in cMOOCs design:

- Use of social media: social networking tools like as Blackboard, LinkedIn, Twitter, streamed audio files or video, blogs, wikis or Facebook sustain cMOOCs, all assisting participants to share their contributions (Bates, 2014; Siemens, 2013).
- Participant-driven content: Content in cMOOCs, according to Bates (2014) is most of the time in principle, contributed and decided participants themselves, which is similar to other community of practice. Additionally, Bates stressed that in practice, cMOOC organisers are likely to request prospective participants who have approaches that are well enunciated to a topic of which they could make contributions that enable learners' debate and discuss.
- Distributed communication: According to Bates (2014) this is possibly the most challenging design practice with cMOOCs because with hundreds of participants. Bates further reported that individual contribute through a diversity of social media,

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hence several diverse inter-connections among participants are sometimes difficult to trail for any lone participant.

- Assessment: absence of official assessment, though participants may request feedback from well-informed participants (Bates, 2014).

2.4.4 Additional Types of MOOCs

According to (Laurillard, 2014), MOOCs are now becoming common and progressively is part of lifelong learning and professional development circumstances. These types of MOOCs are referred to as “*professional development*” MOOCs (i.e. PDMOOCs) (Bonk et al., 2015). Also, (Laurillard, 2014) also report that PD-MOOCs regularly participants wished to advancement the office skills, for instance learning about a new statistical software tool. Significantly, learners can sign up anywhere, anytime using their mobile devices or computers and contribute in a PD-MOOC to get quick access to the content of the course (Laurillard, 2014). In conclusion, Laurillard reported that these MOOCs costs, although who want a certificate for MOOC completion have to pay fee.

2.4.5 MOOCs and Instructional Design

According to Rezaei et al., (2017) regardless of the believed that MOOCs is providing new prospects for learners to contribute from wherever in the world without any precondition, nevertheless, not much is known in the course design and use of instructional design models in MOOC the development (Legon, 2013). Margaryan, Bianco and Littlejohn, (2015) reported that many of the MOOC courses, regardless of instructional design principles, focus more on providing information, and also many learners who register in MOOCs do so for numerous purposes. Consequently, Scagnoli (2012) state that instructional design should take into account variables that delivers a space for different participants. Scagnoli further explained that learners in distance education and open online course in term of learning standard is quite diverse and therefore involve different approaches and teaching methods. King et al., (2014) further supported this proclamation that having the specialist knowledge and known capabilities of education in areas of traditional education (university, professional workplace) for designing effective MOOCs will not be enough and to avoid poor design.

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Therefore King et al., (2014) advised that course designer need set of philosophies to lead decision-making and management of course content, organisational structure, technologies and management on a massive level. Also, Kong and Song, (2013); Zheng et al., (2014), state that while there is substantial research regarding e-learning design principles, nevertheless, tiny effort has been made to extract MOOCs instructional design principles. Besides, studies of Kop, (2011); Kop and Fournier, (2010); Kop, Fournier and Mak, (2011); Mackness, Mak and Williams (2010); Milligan et al., (2013) shows that these design principles of many MOOCs virtually are not been used. Nevertheless, according to Garrison and Cleveland-Innes (2005), the design has an essential effect on deep and meaningful learning. Drake, O'Hara, Seeman, (2015) also state that due to the distinctiveness of the MOOCs, creating a set of instructional design principles is vital to improving learner outcomes. Furthermore, they reported that these principles could improve instructional design for MOOCs and eventually enrich students learning, retention and completion rates. In another assertion, Lim and Kim (2014); Guàrdia, Maina and Sangrà (2013); Scagnoli, (2012); Kukhareenko, (2013) also reported that some researchers in recent years studied the design philosophies and development procedures of MOOCs. However, mostly this research is grounded on the ADDIE instructional design model and specific model for instructional design of such courses are still not being provided. Nevertheless, Bonk et al., (2017) provided some general guidelines in designing a MOOC, which they said, is related to designing any course experience online. However, they emphasised that the content area and the intended type of MOOC experience will determine the design principles. Some of the common principles and guidelines for the MOOCs design are listed below.

1. Planning for student experience.

Bonk et al., (2017) report that planning is the most important instructional design principle for MOOC experience. Given the measure of a MOOC, before the course, there is much expectation in terms of design and production, including any video lectures or tasks, the examination and course assessments.

2. In built feedback for individually experience.

Rezaei et al., (2017) also report that in an online environment, feedback is essential and more in a MOOC. Feedback can come from peers, the instructional staff or instructor(s) or, self-evaluation, mentors and tutors, and the computer system. Furthermore, they reported that

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feedback delivered by computer algorithms often is connected with xMOOCs and other approaches, including diverse forms of group teamwork, peer review and assessment.

3. Create interactivities

Bonk et al., (2017) also recommend that to increase retention, inter-creativities is essential to building collaborative periods in MOOCs like answering questions in a debate or synchronous session, discussion, surveys and role-plays. Reason being that according to Bonk et al., (2017), participants' opinions will be heard.

4. Provide Choice and Variation

According to Bonk and Khoo, (2014), variation and choice of tasks are mostly online, and it should be accessible with various forms of tasks comprising self-initiated groups and teamwork to individual reflection actions. They also recommended the possibility of adjusting earlier produced learning substances using the exchange, blend, variation, removal, and other methods and placing learning objects into depositories and open resource collections.

5. Combine Asynchronous and Synchronous Experiences

Integrating both asynchronous and synchronous experiences in a MOOC offers prospects for thinking and partnership (Bonk & Khoo, 2014),

6. Segment Video

According to Bonk et al., (2017), MOOC participants prefer short video clips of under 20 minutes to more extended periods.

7. Provision updates and Weekly Summaries

Notwithstanding, with all shared resources and provided in a MOOC, a brief of weekly resources shared assist participants manage with excess data (Bonk et al., 2017).

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8. Course resource Sharing

Bonk et al., (2017) also described that MOOC participants often would have experience and knowledge that MOOC instructor(s) are deficient in and therefore sharing such resources and experiences will develop the course resources and learning potentials.

9. The elasticity of Changing Midstream

Since there are numerous people who depend on the MOOC experience, Bonk et al., (2017) suggest that if the course looks to be absent in participation or quality, then the instructors should think of changing the mode of delivery, assessments and assignments. Furthermore, according to McAndrew and Scanlon (2013), in their studies on struggling MOOCs, they advised that the application of open online courses bring new aspects. For example, they reported that by using effective open licenses, such as Creative Commons, it gives opportunity to instructors to share the way teaching is developed, in addition, it gives explicit authorisations to learners. Moreover, they stated that additional research is required to find out about learners motivation, how this can be scaled to genuinely massive access to learning, best access to learning which they concluded, allows instructors to learn about themselves and as well as educate others.

2.5 MOOCs Taxonomy

The taxonomy of MOOCs, as described by Clark (2013), are as follows:

2.5.1 Transfer MOOCs

These types of MOOCs depend on the “name of the institution” to draw learners. Many of these MOOC types imitate traditional academic courses, with lectures, assessment in the form of short quizzes. Coursera courses largely fall into this category. According to Grove (2016), six universities from Europe, Australia, US, and Canada are pursuing to create partner institutions formally accredit a fresh association in which each organisation is Massive Open Online Courses (MOOCs). However, Dr Ankar Mulder, Vice-President of Education and Operations at Delft University of Technology, said that even though there is prospective, it would necessitate the institutions to develop MOOC tested system that can be trusted and to develop a systems of coding that would measure the amount of credits of individually course, and also scrutinise the requirement for admission for individually module.

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As stated by Dr Mulder Grove and cited by (Grove, 2016) that it is possible for MOOCs to be incorporated in normal programs in universities if the quality is good and developed by a university which programs are familiar.

2.5.2 Synchronous MOOCs

Synchronous MOOCs typically consist of a start and finish date that have fixed closing date for assessments and assignments (Clark, 2013). For instance, Ho et al., (2014) studied statistics from 10 completed MOOCs from HarvardX and MITx divisions for online learning. They found that firmer due dates were linked with advanced certificate achievement rates, but fewer students who join late can get a certificate.

2.5.3 Asynchronous MOOCs

According to Clark (2013), asynchronous MOOCs typically have no fixed start dates; with no assignment and assessments, dateline and no end date. Furthermore, Clark (2013) state that MOOCs that are asynchronous benefits participants because anywhere, anytime it can be taken and over diverse time zones, it works well. For instance, Udacity tranquil course admission so that learners can progress at their own pace. Some sceptics point towards this as being an approach to cut the dropout rates as a result of assignment deadlines missed. Lastly, Clark (2013) note that Coursera offers an open self-study option, but one cannot get a certificate of completion in this mode.

2.5.4 Adaptive MOOCs

According to Izumi; Fathers and Clemens, (2013), describe adaptive learning as a method that alters the guidelines dynamically dependent on individual disposition or ability. In reference to Learn Smart software, the McGraw-Hill company summarises the benefits of adaptive learning. Adaptive learning was defined as a means of education that personalise learning by means of algorithmic technology that is progressive to frequently assess learners' understanding, confidence levels, skills and design (McGraw-Hill, 2013).

In eLearning, according to Chauhan and Goel, (2015), for numerous motives, an adaptive learning theory is presented, like altering quality of content for learners who are visually impaired, course selection (basic/intermediate/advance) and presenting content etc.

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Furthermore, they Chauhan and Goel, (2015) reported that the theory of adaptive learning includes adaptive interphase content and collaborations.

“Adaptive learning is a method of education that seeks to personalize learning by using sophisticated algorithmic technology to continually assess knowledge, skill, and confidence levels of students and design targeted study paths based on the resulting data” (Izumi; Fathers and Clemens, 2013.p1).

According to Daradoumis et al., (2013), adaptive MOOC is a prospect, and would make MOOC courses more bespoke. Besides, they reported that course designers, tutors, policymakers, managers, and educational institutions would benefit by linking all the MOOC data and using it to expand delivery of courses, educational activities and learning experience. Also, Daradoumis et al., (2013); Nguyen et al., (2014) state that software agents could gather data on online setting routinely based on indicators that are pre-defined. Daradoumis et al., (2013) further revealed this could be achieved by means of innovative Learning Analytics tools and Educational Data Mining Techniques Agents examining the learner’s profile.

2.5.5 Group MOOCs

Group MOOCs typically begins with collective students’ groups, which drive is to improve students’ retention. For instance, NovoEd provide both MOOCs and a closed, regulated courses (Clark, 2013; Bates, 2013). According to Clark (2013), some course and subject, such as business courses and entrepreneurship, requires concentrated method to group work. Additionally, some of these groups rate each other's progress and commitment because they have mentors. Groups can be reorganised during the course (Groupmooc, 2016). Despite the prospective benefits of a group MOOC, Ashleigh, (2018) reported that study groups can constitute a huge distraction if not correctly assembled and numerous opinions can ruin it. However, in their studies Krasny et al., (2018) report that 41 groups was formed ranging from 58-304 participants in their MOOC. The intention was to observe how self-identified volunteer could encourage relationships and leadership among minor students groups. Krasny et al., (2018) concluded in their finding that, minor self-identified groups in MOOCs could motivate social learning, address issues of access, and hypothetically produce new knowledge used in courses in the future.

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2.6 MOOC Platforms

According to Salamah and Helmi (2018), the criteria required MOOCs platform should include characteristics like challenges satisfaction, communication, interaction, motivation and ability from a student's viewpoint.

In their studies, Wong et al., (2015) report that the MOOC platform pedagogical orientations affect their courses delivered by partner institutions. They also found that the courses were tailored towards the pedagogic features of their platforms. As a result of these findings, they reported that the impact for organisations rests in the resources and labours involved in course development, considering the pedagogic structures of the platform and for prospective learners, study mode. However, it was noted that there is no proof that the diverse pedagogical structures lead to inconsistency in efficiency learning and teaching (Glance et al., 2013). Bayne and Ross (2014.p25) also state that '*each MOOC is profoundly shaped by its designers, teachers, platforms and participants*'.

2.6.1 edX

Massachusetts Institute of Technology and Harvard University created edX MOOC platform (Yuan, 2013). It became an open source project in March 2013, the purpose of which is to act as the WordPress for MOOC platforms, letting users to use plugins to enlarge the principal functionality. Some of the courses are not free. edX has a up-to-date feel, is fast with the ability to offer large enrolments (Swope, 2014). It has, by 2018, over 18 million users with over 1800 courses (Shah, 2018).

2.6.2 Coursera

Coursera is company driven by profit (Yuan and Powell, 2013). The university partners that are involved are namely University of Pennsylvania, Stanford University, Princeton University and University of Michigan. Coursera offer more than 1150 courses in 18 subjects, including education, medicine, business, engineering, mathematics, computer science, humanities and social science (Classcentral, 2018). Coursera also partner with some universities to offer classes for individuals willing to pay fees, work with an instructor to have some additional assignments and be measured (Classcentral, 2018). Most recently, Shah (2018) reported that the platform has over 37 million users.

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Coursera emphasize the structures of peer assessments, mastery learning and blended learning (Coursera, 2018). Mastery learning initially was suggested by Bloom (1968) as an instructional approach that support participants comprehend a topic fully before advancing to the more difficult one. Courses on Coursera offer instant feedback and offer randomised varieties of the task to enable to re-study and re-attempt until mastered (Wong et al., 2015).

2.6.3 Udacity

Udacity was founded by Sebastian Thrun, Mike Sokolsky and David Stavens (Yuan and Powell, 2013). Udacity provides paid online courses in general sciences, programming, computer science, mathematics, entrepreneurship. On course completion, students receive an accomplishment certificate specifying their attainment level, signed by the tutors free (Yuan and Powell, 2013). Over 10 million registered users on the platform and in 2018 (Shah, 2018).

2.6.4 Udem y

Udemy was founded in 2010. It offers a learning platform for instructors looking to teach online courses (Yuan and Powell, 2013). Udemy offers over 80,000 courses (Udemy, 2018). Payment is required for these courses, and the average price for a course is between US\$20 and US\$200. The platform consists of designers, photographers, coders and other experts who offer their knowledge in an online course form. Udemy's distinctive forte is a base of over 24 million registered students (Udemy, 2018).

According to Salamah and Helmi (2018), Udemy is intended to teach online full time or fully have the time and commitment, Udemy is more established and has enhanced usability and more to choose from, and Udemy consents to send email announcements to the students.

2.6.5 Canvas Network

Canvas Network is established and maintained by Instructure, an American education technology company that collaborates with institutions, technologists and educators to build open educational resources and break down obstacles to learning. The Canvas Network provides open, online courses taught by educators universally. It offers a place and platform where students, teachers and institutions globally can link and chart their course for individual growth, academic inquiry and professional development (Canvasnetwork, 2018).

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Canvas Network, over 18 million registered users (Canvasnetwork, 2018). For this research, the experiment will involve running an online course “Entrepreneurship and Innovation MOOC” hosted on the Canvas Network.

2.6.6 P2PU (Peer to Peer University)

In P2PU is establish 2009 with capital from the Hewlett and Shuttlesworth Foundation (P2PU, 2018). It is free and it focuses on teaching and learning by peers, for peers. P2PU offers some structures of other MOOC platforms, but its approach is community focussed (learning circle-which combines free online courses with peer learning practices in public spaces) and aims to provide prospects for anyone enthusiastic about teaching and learning online (Malcom, 2018). P2PU have over 50 courses, and the procedure of refining the course quality depend on community-review, revision and feedback. As stated on the P2PU website *“Everyone has something to contribute, and everyone has something to learn. We are all teachers & learners. We take responsibility for our own and each other’s’ learning”* (P2PU, 2018.p1).

2.6.7 Academic Earth

Academic Earth provides links to free courses online from the topmost world’s universities. The website also shows sequences of ongoing original videos from MIT, Berkeley, Harvard, Stanford, Yale and Princeton, which can be shared by the Academic Earth community. The platform does not host the courses itself but directs the user directly to the course publisher. Therefore, the format of the course and any tools depend on the institution providing the course. The site also offers guides to online degree programs with a search tool to find accredited online college courses by subject area and degree level (Mooclab, 2018). Furthermore, Mooclab report that they have the following features on their platform.

- 750+ courses
- 8,500+ individual online lectures
- 25 partner institutions
- Downloadable QuickTime version of some video lectures
- “Playlists” featuring a curated selection of courses in a particular theme

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- Sharable videos
- Video transcripts
- Comments boards linked to videos

Other MOOC platforms describe by Dhiman (2016) are as follows;

2.6.8 FutureLearn

The Open University own Future Learn, UK and provides some free and fee-paying courses online ranging from topics like humanity, business, arts, science and technology (futureLearn, 2018). Most recently, Shah (2018) and Statistica (2018) report that the platform now has 8.7 million registered users from 190 countries with over 700 courses. Learners can upgrade for a fee depending on the course to obtain a Certificate of Achievement, have access to course test if any and unlimited access to course as long as it's on the platform (Walton, 2017). The MOOC platform has enabled learners to take part in online courses and delivers access to some world top universities with degree course modules worth up to a maximum of 30 UK academic credit. The Open University is also allowing learners to earn academic course credits from the FutureLearn MOOC courses, for degrees and master's in business administration and professional qualifications (Paddick, 2016).

Following the success of building a large community of learners, FutureLearn has gone a further step to redesign their platform to strengthen social learning about a new type of massive-scale social learning established on the philosophies of dynamic learning (FutureLearn, 2018). The aim, according to Sharples (2018) and Otoo (2018), is to build a learning community that hold engagement deliberations, share ideas and support each other. Furthermore, Otoo explained that instead of building distinct 'social spaces' like online forums, the deliberations are linked to the teaching materials, and videos have rolling remarks area, open to everybody, where learners can start by looking at what others are saying and then respond quickly. Sharples (2018) summarise that the design of the FutureLearn platform is made to support the three ideologies of excellent social learning, storytelling and visible learning.

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Additionally, Otoo (2018) and Wong (2015) explained that the platform features courses in which methodically individual along the way tells a story with helpful tips and trials, to build and test students' understanding. The FutureLearn platform also offers participants through a 'to-do-list' to make the learning development visible, giving the course outline, previous and forthcoming activities (FutureLearn, 2018). It motivates discussion ideas and comprising other learners over the conceptions of 'discussion in context' and 'following' applied in the platform (Otoo, 2018). Learners can make remarks besides the content, and trail specific learner's contributions. With such features, Otoo (2018) and Wong (2015) concluded that Future Learn features is a huge-scale social learning platform.

2.6.9 University of the People

According to UoPeople, (2018), University of the People is the initial tuition-free, accredited, non-profit institution in the world, online academic institution. However, students must pay administrative costs (UoPeople, 2018). It offers undergraduate degrees in computer science, business administration and health sciences and as well as MBA (Master in Business Administration) program (UoPeople, 2018). According to Ross et al., (2014), the University of the People has trodden a different path. Additionally, Ross reported that the California-based online university launched three years before pioneering MOOCs such as edX. It had just 500 students by the time it was accredited in early 2018 but had reached 10,199 students (UoPeople, 2018).

2.7.0 Open2Study

Open2Study is supported by Open Universities Australia (OUA). It provides courses free for people globally. It has over 140 courses offered online through the leading Austrian universities and also partners with other Universities like Griffith, Abu Dhabi and James Cook (Open2Study, 2018). For instance, according to Wilson et al., (2014), Massey University saw a prospect in penetrating the Australian marketplace by creating a collaboration with Open Universities Australia (OUA) to create three pilot subjects (Open2Study, 2018). Additionally, Wilson et al., (2014) state that the trial was established through OUA's research arm of Open2Study whose structure supports them to host big amounts of admissions of over 400,000 registrations.

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They concluded that this had an impact on the retention rate of Open2Study's 20%, which is greater than numerous MOOCs, and creation video services remained a significant element that influenced retention.

2.7.1 OpenLearning

OpenLearning is a MOOC platform and it provide free online courses (OpenLearning, 2017). According to Munbodh, (2017), Open Learn is the Open University UK free learning library, which offers over 1000 free courses on variety of topics on sectors comprising health, science, psychology, business, history and education. One can choose from entry-level, intermediate and advanced. Many of these courses are based on Open University course material while others are explicitly written for Open Learn. The MOOC platform aims to inspire, motivate and empower through education (OpenLearning, 2017). According to Salamah and Helmi, (2018), Open Learning offers courses to focus on groups or community, connectedness between teachers and students and understudy commitment.

Also, according to Wong (2015), the educational fundamentals of OpenLearning include students' structure, enablement, precise and active learning practises and connectivity. Additionally, Wong (2015) report that in the learning process, through collaboration, learning are inspired to add in the learning progression with the community of teachers and colleagues, such as teaching and sharing their thought via the course platform. Hence, OpenLearning defines its MOOC platform as a social platform allowing the development of learning groups and contributing to knowledges of users related to that of social media platforms. In conclusion, Mitros, Agarwal and Paruchuri (2014) report that OpenLearning place more importance on social constructivist which stress the role of the community of learners.

2.8 MOOC Pedagogy

2.8.1 Learning Theories and its Applications to MOOCs

Introduction

Recently many researchers have deliberated on the different pedagogical designs of online learning and have try to theoretically analyse MOOCs for it to have a significance place in education (Anders, 2015; Kesim and Altinpulluk, 2015).

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Distance education theories have been classified by Anderson and Dron, (2011) into three groups, namely cognitive behaviourism, social constructivism and connectivism. Behaviourism, according to Kelly (2012), came from the works of B. F. Skinner and the concept of apparent conditioning. Kelly (2012) state that behaviourist theory held that learning occurs when new behaviours are acquired through an association between stimulus and responses, which was a definition of cognitive behaviourism before the internet era. In addition, Teater (2014), reported that the theory of social constructivism stems from Berger and Lukman, (1966), who explored actuality conception and the influence of individual meaning established on life experiences, society and prospects, rules and norms that they termed “social constructivism”. Derry (1999); McManon (1997) also report that, based on the understanding of what occurs in society, social constructivism stresses the significance of context and culture and therefore the construction of knowledge is founded on this understanding.

According to Kim (2014), this perception is closely related to many theories that are modern, particularly the development theories of Bandura’s social cognitive theory; Vygotsky and Bruner; (Schunk, 2000). To further support the argument, Teater (2014) stated that social constructivism has been refined by theorists into three more precise theories, which highlights individual or collaborative activities in reality construction. Hence, it shows that learning depends on the abilities of a collaborative approach within an educational community, which is specifically positioned and setting-bound (Eggen and Kauchak, 1999; McInerney and McInerney, 2002; Schunk, 2012).

Nevertheless, according to Dulin-Salisbury (2014) in her article, raised awareness of the limitation of online learning to support social constructivism. The author argue that social connection and social learning is mostly body language, which is challenging to facilitate online. Dulin-Salisbury (2014) also concludes that social constructivism is a lens by which one can have an understanding of online learning which is not necessarily constructivist but rather how the course is designed. Overall, Ruley (2010), report that a constructive style of instructional strategy facilitates adult learning which helps to change perception of learners in online learning and supports them to learn in a more collaborative, genuine and responsible way. Meanwhile, Connectivist theory, indicates how web 2.0 and social networks supports the communication and interaction process for the new digital age (Siemens and Downes, 2005). The learning theory of Connectivism was developed by George Siemens in 2004.

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He states that behaviourism, constructivism and cognitivism was established in an age in which technology was underdeveloped and significant on education (Siemens, 2004). Additionally, Anderson and Dron, (2011) report that the learning procedure in connectivism occurs as the learners channel their knowledge into the combined experience of the community and make connections.

2.8.2 xMOOCs and learning theories

xMOOCs, as earlier stated in 2.4.2, are based on, or follow, the traditional classroom structure (Goldberg, 2017). They have a mixture of pre-recorded video presentations with tests, quizzes and another form of assessment (Bates, 2014; Mangelsdorf, 2012; Rodriguez, 2012). These learning materials are provided to support the teaching of the course and enable each student to follow the course at their own pace (Mangelsdorf, 2012).

The format of the xMOOC has moved in the direction of greater flexibility based on students' learning behaviours. Wrigley, Mosely and Tomitsch, (2018) note that xMOOCs were originally modelled on university courses and follow a semester timetable and related assignments deadlines. Nevertheless, because providers are more cognisant of student's online activities, many xMOOCs now offer self-paced courses and the data they have collected allows them to personalise more student' learning experiences (Wrigley, Mosely and Tomitsch, 2018). xMOOCs are rooted in cognitive-behaviourist theories where learning is centrally controlled, highly organised, structured, instructor designed and directed, and focuses on the transmission of information (Wrigley, Mosely and Tomitsch 2018; Clow, 2013).

Kasim and Atinpullum, (2014) also report that despite small differences in MOOC sites like Coursera, Udacity, edX, etc, xMOOCs generally share the features of a traditional behaviourist approach. For instance, Bates (2012) and Marsaglia et al., (2014) state that the Coursera kind of xMOOCs typically follows the design of a traditional behaviourist model, where information is delivered traditionally through instruction, rather than providing an environment in which more independent and critical thinking skills can be developed. Likewise, Bates report that a behaviourist model is based primary on information transfer from instructor to students through video, for example, with learners being evaluated through a variety of mechanisms.

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Anders (2014); Bates (2014); Marsaglia et al., (2014); Kalz and Specht (2013) report that short videos of 4 - 15 minutes with embedded tests provides automatic feedback to help students sustain focus and retain knowledge. Likewise, Anders (2014) stress that the learning process consists of practice problems, text materials and in some cases, combined testing. This approach, according to Bates (2012), diminishes the learners to a situation in which they simply practice problems which slows learners' creativity, cognitive development and creation. Marsaglia et al., (2014) also agree with these statements as they reported that in the learning process in xMOOCs, learners are not dynamic participants, rather, their role is to consume the course and learning materials as offered.

Siemens and Downes, (2005) first articulated the principles of connectivism which formed the basis of the cMOOC. They state that the Connectivism theory of learning stresses the influence of networking with other individuals, bringing together different views, and focusing on the ultimate aims as the basis of learning (Siemens and Downes, 2005).

Marsaglia et al., (2014) also notes that some xMOOCs model, such as the Khan Academy, adopts an essentially behaviourist model, such as the skill and drill assignments which often follows by a video lecture. Additionally, they reported that learners only progress to the next level when they correctly answer seven questions successively. The theory being that the repetitive nature of these assignments inspires mastery learning (Marsaglia et al.,2014).

Rodriquez (2012); Anderson and Dron (2011); McDonald, Yanchar and Osguthorpe (2005) argue that courses provided through xMOOC platforms typically follow an instructivist pedagogical or cognitive-behaviourist method. In reference to the classification established by Anderson and Dron (2011), Anders (2014) points out that the principal distance education pedagogical theory before the internet period (postal, mass media e.g. TV, and interactive technologies) is cognitive behaviourism. It is established using a training model that is content based, provided at scale through a one-to-many delivery approach (Anders, 2014). In addition, Anders state that it was prior to internet technology, so it was accomplished through print media and teleconferencing.

Poplar, (2014); Fidalgo et al., (2014) also report that the design and features of many xMOOC platform interfaces are now using a diversity of collaborative and social activities to fit the concepts of social-constructivist pedagogical theories.

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Anderson and Dron, (2011, p.85) also report that in the second generation of social constructivist literature, the pedagogical theory posits that “*each learner constructs means by which new knowledge is both created and integrated with existing knowledge*”. In this process, they explained that when it comes to the method of developing new skills and negotiating meaning, the development of relationships within a social context with other individuals are essential.

Mazouze, (2013) also notes that in its best form, an xMOOC could enhance the effectiveness of knowledge and competence achievement as it offers a robust methodology based on measures of assessment, high-quality instructional materials, driven by clear learning objectives. Nevertheless, there is criticism of this method as some researchers report that the pedagogical principles are ineffective. Guardia, Maina, and Sangra, (2013); Hollands and Tirthali (2014); Rodriguez (2012); Stacey (2014). Mackness et al., (2013, p.15) note that:

“The pedagogical approach of the massive xMOOCs is currently under scrutiny since some research suggests that large-scale lectures and demonstrations do not support learner understanding”.

Using a social constructivism perspective, Anders (2015) notes a conflict with the xMOOC model and research. This suggests the significance of applied practice, formative feedback and social engagement for active learning online. Anders therefore recommends the use of a hybrid method in xMOOCs with quality content to support the more intimate and more vibrant social learning understandings (Anders, 2015). Often hybrid MOOC have used a flipped or blended course model.

“that mixes video-based instruction and automated assessment, accessible in a MOOC with interactive face-to-face activities: teacher support for a deeper understanding of the topics, group projects and problem-based learning” (Holotescu and Grosseck, 2014 p.2).

Besides, Holotescu and Grosseck, (2014); Fidalgo et al., (2016) describe that in this approach, a social network is integrated to enhance engagement by balancing the instructivist methods of xMOOCs with social constructivist ones. Anders (2015) and Crosslin (2014) emphasise that although xMOOC courses are typically very organized, these hybrids integrate features of andragogical learning that can benefit learners to pursue their personal goals and offer greater autonomy for self-direction and self-regulation.

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Anders (2015), Fidalgo et al., (2016) state that diverse learners should be supported using a hybrid MOOC design approach, as this can accommodate a wide variety of learning capabilities.

The Canvas Network platform, which is the platform that hosts the “*Entrepreneurship and Innovation*” MOOC, integrates written discussion forums which allows both instructors and students to start a discussion thread and contribute to as many discussion topics as necessary. Discussion forums are used for discussing topics and integrated into course content or student’s groups (Canvas Network, 2018; Qi and Reid, 2016). They can be generated by the course designer teacher or students and may be used for grading purposes (Canvas Network, 2018). In addition, the discussion forum is aligned with the Canvas Gradebook to support assessment (Canvas Network, 2018). In the redesigned Entrepreneurship and Innovation MOOC course, each module has a discussion forum. Students are expected to interact and express their views on the weekly course topics, sharing resources, links and comment on the input of others related to the course.

2.8.3. cMOOC and its application to learning theories

According to Marhan (2006), connectivist principles developed by Siemens and Downes integrates network principles, complexity, chaos and self-organisation theories. Siemens (2005) also states that a network consists of nodes, which can be group, fields, ideas, resources, systems, individuals. Siemens (2004) establish connectivism principles, which include extensive regulatory statements:

- Knowledge and learning which are embedded in a variety of views.
- Learning involves a method of linking specific information sources or notes.
- The capacity to see links between ideas, concepts and fields are a vital skill.
- All connectivist learning activities are designed to provide up-to-date knowledge.

Duke et al., (2013) also deliberated that connectivism is a pedagogical opinion, instructional theory or only a learning theory. While series of dialogues have been created as a result of Connectivism, it is not a unique educational theory for learning according to Calvani (2008).

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In addition, as stated by Hilgard (1958), connectivist cannot explain what constitutes learning. In addition, Maddock and Fulton (1998, p.9) pointed out that *“If a theory cannot explain all facets of human behaviour, then it cannot explain any”*.

Kerr (2006) also states that current state of existing well-known learning theories like behaviourism, constructivism and cognitivism have been modified by connectivism and so therefore for the new theory, there is uncertainty. Moreover, Verhagen (2006) notes that connectivism is a pedagogical opinion. He proposes that the learning theories should focus on addressing the matter of how to support the learners at the level of instruction. Therefore, Verhagen (2006) state that if connectivism is held as a learning theory instead of a connection, then provision should be made for the development and change of the learners understanding. Kerr (2006) agrees with this perspective and upholds that connectivism as a learning theory is not valid. Kerr also state that connectivism may not be essential to the current learning theories but may illustrate how the instruction is affected by technologies in a diversity of ways and not in the method of learning itself.

In contrast, Downes (2004) gives the following reasons why connectivism should be among the learning theories. According to Siemens (2004) connectivism is measured as the progress in the way students learn with the understanding and information assimilated through a personal or individual network engagement. In addition, Siemens (2004) state that learners in developing their individual networks can consider the diversity of views which is required to make critical decisions necessary for learning. Crosslin (2016) also agrees with this statement as he reports that in connectivism, the power is moved away from instructors and learners to a collective group.

In conclusion, therefore, as new social networks are emerging, connectivism will continue to play an important role where these new tools will continue to define and shape the manner in which we learn and reflect. Today learners are no longer inert consumers of information but active producers of it. From the preceding discussions, apart from connectivism being a new theory, it can be established that learning is social, involves a method that is active, and it occurs in a definite context (Flynn et al., 2015).

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2.8.4 Learning Theories and its Application to Web 2.0 Technologies

The review of literature in section 2.12 on social media shows that social media could affect learning positively. Researchers like Fidalgo et al., (2014); Ertmer et al., (2011); Larusson and Alterman, (2009), report that students' usage of social media in working on their assignments had an affirmative consequence on the level of learning. Mbatl (2013) also states that social media use in education among teachers and students and in the industry by experts, allows asynchronous or synchronous communication to support ideas sharing. Furthermore, in a study carried out using a wiki tool involving collaborative learning exercises, Zhu (2012) and Lund (2008) affirm that it has an affirmative influence on students who discussed their writing work with peers and obtained comments before the final publication of their work. It is significant to comment that a 'wiki' can be used within a learning group as an indication of knowledge sharing (Lund, 2008). In terms of knowledge, Janssen et al., (2010) state that when learners are fortified with intellectual capability, collective learning is more important. Also, according to Enunbon (2010); Livingstone (2015), teaching and learning are being transformed significantly in higher education using Web 2.0 technologies. In addition, Enunbon (2010), Ahern (2016) further reported that universities and colleges are speedily embracing these technologies and using them to not only enhance their traditional curriculum but also to include, courses that are offered outside the college campus.

Flynn et al., (2015) suggests that using social media offers the prospect for instructors to implement connectivist and constructivist in innovative and creative ways. (Mbatl, 2013) reports that social media is used among teachers, students, industry expert for communication, which supports the sharing of ideas. Schrader (2015); Jiang and Kotzias, (2016) report that social media is possibly able to improve the formation of a learning community, stimulate learner engagement and participation, and generally provide a learning experience for the new-generation learners raised in the connected world of social media. This opinion is also shared by Al-Rahmi and Zeki, (2015); Ractham and Firpo, (2011) who report that when using social media, active collaboration learning increases. Additionally, Al-Rahmi and Zeki (2015), Anderson et al., (2010); note that through virtual social setting, students connect more with their peers organising social events or collaboratively solving problems.

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Enunbon (2010) report that it has also been established that constructivism and Web 2.0 offers both learner and outstanding instructor prospects to harness their efforts and make the learning process rewarding. According to Mbati (2013), discussion boards in social media facilitate constructivist learning and serve as a source of motivating cognitive discord on part of students. Mbati (2013) reports that discussion boards are used as a tool for reflection. This report is consistent with Juwah's (2010) finding which suggests that the discussion board can assist as an online social media tool for motivating additional principles of constructivist learning.

Flynn et al., (2015) points out there is an association between connectivism and constructivism. Flynn explains that although connectivism is novel and based on the concept of learning in a technological era, there are connectivist themes that mirror the themes of constructivism that learning is social, involves action, entails reflection and follows in a specific context. Siemens (2005) argues that it is a new kind of learning, which has been included within the constructivist paradigm. According to Flynn et al., (2015), the theory that is distinctive to connectivism is that technology has transformed the way of learning, function and work. Therefore, Siemens (2005) proposes that educators must be knowledgeable with the effect and advantages of these learning tools to support and prepare learners to flourish in the age of digital technology.

Similarly, Flynn et al., (2015) states that initially, the cognitive theory appears to be the outlier. However, upon serious reflection the cognitive theory aligns with the connectivist theoretical frame. It identifies specifically that there is a restriction on the working memory of individual's, and that the information must be moved to lasting memory (Cowan, 2014).

According to Lahiri and Moseley (2015), using social media to assist teaching, offers instructors with the prospect to implement connectivist and constructivist learning theory in innovative and creative ways. They reported that the connection of learners on social media increases the social perspective for learning, improves learning with peers and connection outside the classroom environment. Other benefits are that it enables learners to share content, easily exchange ideas, connect learners and build a community of practice with content experts. Schrader (2015) reports that both sociocultural constructivist and cognitive theories are relevant as technologies and social media change and learners use them within more broad and varied communities.

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Also, Lahiri and Moseley (2015) report that social media supports Bandura's social cognitive theory which showed that behaviour could positively influence self-motivation. Bandura recommended that through observational learning, behaviours could be learned (Matei, 2010). Additionally, Lahiri and Moseley's (2015) studies shows that students utilised the online forum wiki spaces to display their work on complex and contemporary issues on health collaborations for peer review and work critique. The results showed that, at the end of the assessment, students developed long-term and more in-depth learning with generally higher academic writing standards.

Flynn et al., (2015) recommends that based on their findings, educators who use social media should know or understand constructivism and connectivism. This is because knowing how learning theories impact on learning can help educators effectively design curricula, use appropriate tools and practice learning and assessment events. They gave an example in the case of medical education where medical educators were provided with formal education on learning theories. These theories were then applied more thoughtfully to social media usage (Flynn, et al., 2015).

In conclusion, this review of literature shows that connectivism and constructivism enable us to understand better how today's learners take part in learning activities in a range of social networks. Some researchers argue that the socially networked environment does not completely address the issue of how we cognitively process new knowledge by reflecting on existing experiences. Constructivism stresses the way experiences are built through individuals' sense-making activities, therefore some researchers argue that these experiences can be through activities that are primarily experienced through digital environments (Lahiri and Moseley, 2015; Flynn et al., 2015). In all, social media environments and evolving technologies are promoting and enabling people to develop innovative and varied ways to interact and create knowledge that is both inside and outside the academic environment. Therefore, as new social networks are being developed, connectivism and constructivism will continue to play a significant role where the control is shifted more from the tutor to the learners. Thus, a new epistemology is developing. From the literature review it is evident that connectivism contributes to the new model and therefore it can be seen as a separate or novel learning theory.

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2.8.5 Summary

This section explained the learning theories, how learning occurs, and how it affects the way students learn. In general, these learning theories are important in the development of pedagogical strategies for MOOCs. It also explains that educators should acquaint themselves with various methods of learning, social networks and comprehend how they can use them in the design of MOOCs to enhance the student's learning experiences.

2.9 Issues and Challenges with MOOCs

Research has shown that there are issues and challenges for the MOOC - the very nature of the MOOC is one of its most significant problems which has become more pronounced as MOOCs have become increasingly popular (Littlefield, 2011). Most courses attract the enrolment in a single session thousands of students with only few facilitators, and sometimes the instructor is absent (Nkosi, 2014; Onah, Sinclair, Boyatt, 2013). Other challenges are;

2.9.1. Lack of Feedback to Students

According to Littlefield (2014), in traditional classrooms, students can learn from feedback and know their mistakes, but unfortunately, in most MOOCs, in-depth feedback is not possible. Furthermore, Littlefield (2014) also reported that many instructors are unpaid for the additional hours needed - no instructor can moderate in a week thousands of papers. In some cases, instant response in the form of tests is provided. Nevertheless, some students repeatedly make mistakes again without a mentor (Onah, Sinclair, and Boyatt, 2013). However, Atiaja and Proenza (2016) suggest that integrating follow up automatic tools that monitors mass group of students when they need help is useful. Additionally, they explained that the tutors could be notified in their email box through an alert or can attend to the needs of the students at the accurate time through instant messages on their smartphone. They further stressed that this would help students, make them not feel abandoned, and gave an instance Moocsmentor, which is able to manage user's involvement of the platforms of the universities of Berkley, Stanford and Harvard

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2.9.2. Lack of Motivation

Schunk, Pintrich, and Meece (2008) describe motivation as the procedure where activities that are goal-focused is initiated and maintained. Motivation can have an influence on how one learns, their choice and what is learnt (Schunk, 1995). Most studies have also shown that a high motivational level is required for the completion of distance learning programs, including MOOCs (Khalil and Ebner, 2014; Knowles and Kerkman, 2007). A study by Schunk et al., (2008) reveal that motivated learners have more likely to be active learners.

As MOOCs generally is free, open and flexible, most times participants tend to select sections of knowledge that interest them depending on their goals (Kizilcec and Schneider, 2015; Wang and Baker, 2015). For instance, Wang and Baker (2015) establish that those who completed had more concerned in course content, as compared to the non-completers just want to have the experience. In a broader viewpoint, Kizilcec and Schneider (2015) found that diverse motivational goals such as making new groups, on the job training/subject updating, relevance to a career change etc. Might forecast different behavioural forms for MOOC learners.

Therefore, many motivational theorists argue that intrinsic motivation is sustained by learning goals (Deci and Ryan, 1985; Xiong et al., 2015). Ryan and Deci (2000), stated that intrinsic motivation is used to describe in instances where learning activities are performed because of one's inherent interest, whereas extrinsic motivation denotes actions or behaviour that is motivated by external reward. According to Wang (2014), learners in MOOC consist of having each or both forms of motivation.

Keller and Suzuki (2004) note that because most online students work independently, they face motivational challenges; as a result, relatively high dropout rates have been observed (Adamopoulos, 2013; Jordan, 2013; Onah et al., 2014). Thus, few researchers have tried to incorporate social media like Facebook, Google + to increase interaction, questions sharing outside the MOOC course (Zheng et al., 2016; Fidalgo et al., 2014).

2.9.3. MOOC Discussion Forums and Facilitation

Mak, Williams and Mackness (2010) report that forums serve as a vital element of use, practical online course, providing the majority of instructional interaction and asynchronous communication.

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Many researchers emphasised the importance of collaboration in MOOCs that are good quality (Mcauley et al., 2010; Waard, 2011; Levy and Schrire, 2012; Fisher, 2012). They confirm the crucial part that collaboration plays a crucial role in MOOCs as learners develop their learning network and construct their understanding from the connections and nodes in the digital setting. Discussions in forums also improves the prospect of networking and increases chances for collaboration and consultation with other experts (Anderson and Kanuka, 1997). However, many researchers have also emphasized the significance of the role of the instructor or moderator as very vital in the success of online forums (Berge, 2006; Anderson and Kanuka, 1997). In contrast, study by Chang et al., (2015), a team of researchers and their collaborators at Microsoft and Boston University in a MOOC online discussion forum involving over 100,000 students, they have studied the behaviour, found out that interaction was low and continued through the course.

To further shed light on this point, McGuire (2013 p.1) wrote a stimulating article in which he states,

“Is the centralised discussion forum a barrier to student engagement? Ironically, the biggest obstacle preventing MOOC students from forming relationships is the feature most relied on to encourage them. Discussion forums are the number one complaint. Most MOOC discussion forums have dozens of indistinguishable threads and offer no way to link between related topics or to other discussions outside the platform. Often, they cannot easily be sorted by topic, keyword, or author. Thus, conversations have little chance of picking up steam, and the community is more often stifled than encouraged.”

Besides, they also noted that teacher participation failed to improve matters. Indeed, they said there was some proof that in an online discussion, teacher participation really increases the decline rate (Chang et al., 2015). However, William (2015) report the contrary as he found an indication that in their studies that, when MOOC teaching assistants participated actively in the MOOC discussion forums by responding to posts, students participated more in the forum and had higher grades.

Hill (2013) reported in a study involving 23 separate MOOCs and looking at discussion forum activity on the Coursera platform. Results from all registered students across showed that all the MOOC had below 10% of student's forum post, and for all registered students, most were below 5%.

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Despite these adverse reports, some researchers reported positively on the benefits of discussion forum. For example, Rosé et al., (2014) and Yang et al., (2013) conducted a ‘survival analyses on a MOOC dataset to comprehend the social activities that influence students’ dropouts on weekly bases. They found that there was a relationship between some aspects of peer interaction and retention. Mostly, students who interact with other students in the dialogue and remained in the forum interaction for long time tend not to drop out of the course. Morrison (2013) also further suggest that forming and facilitating small group activities and prompt feedback are instrumental to sustaining students online. Some researchers have also recommended connecting students during the MOOC course period, using social media such as Facebook, blogging, Twitter, Google+, can sustain the socially networked pedagogy of open online education model (Fidalgo et al, 2014. Purser et al., 2013).

2.9.4. Accreditation and Quality Assurance

Major MOOC are beginning to offer accreditation in several different ways to transferring of earned credits as well as quality assurance. For instance, Udacity offers Nanodegrees, where students can select short courses and earn micro-credentials (Commonwealth of Learning (COL), 2016). COL report that Coursera's program, offers degrees that are specialised and accredited. edX's, also offers courses of specialised certificates of accomplishment. In addition, Weale (2016) report that University of Leeds and Open University have started offering online course that that would gain formal accreditation towards their final qualification. FutureLearn’s programs also allow learners to earn professional accreditation or academic credit that used to transfer credit to lessen the length of time of a university degree. An account from the Commonwealth of Learning (2016) further stresses that for several supporters of open education, they do not mind whether a MOOC is not facilitated or accredited by a university.

It gave instances of the British Council, United States Government, the Museum of Modern Art (New York) the World Bank, Google, AT&T and the American Museum of Natural History have run valuable MOOCs that offer open and free access to learning experiences. Nevertheless, some universities are designing MOOCs for a different purpose. MOOCs in India and Malaysia, for instance, can form part of accredited degree courses, which is part of university degree (Commonwealth of Learning (COL), 2016).

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2.9.5. Intellectual Property Issues

Compliance and copyright issues are significant challenges in MOOCs (Thomson, 2013). Thomson stated that the global nature of MOOCs makes copyright tough because copyright laws operate on the assumption that the copyright regulations of that country govern the university delivering the course.

According to Gore, (2014), many involved with MOOCs creators are concern over the ownership rights and intellectual property of course content. Another problem is that most of these platforms have some languages in their terms of service that colleges and universities should be attentive of Thomson (2013). Thomson further stress that some platforms even claim content ownership. Many institutions, content authors, teachers, are displeased that MOOCs are trying to control the delivery of academic course material. This issue according to Cheverie (2015) was state in the EDUCAUSE Executive Briefing, What Campus Leaders Need to Know About MOOCs, which stated,

“Some commercial MOOC platforms have highly proprietary terms and conditions that claim ownership of course content and prohibit sharing or remixing of material.” (Educause, 2012, p.2)

2.9.6. Localisation Issues

Keramida (2015) also report that MOOCs in some countries like the US had is developed but that faces some issues locally like language barrier. Additionally, he suggested that developing MOOCs in multiple languages would help solve the problem. This trend, according to Shah (2016), has made way for the sturdy existence of non-US MOOC providers, instance Spanish-speaking MirandaX.

2.10 Students Engagement in MOOCs.

Kuh (2009, p.683) has define students' engagement as

“The time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities.” (Coates, 2007, p.122) defines engagement as *“a broad construct intended to encompass salient academic as well as certain non-academic aspects of the students' experience”*

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Incorporating the following: vibrant and group learning, involvement in inspirational, staff communication, educational involvements and sense and involvement in motivating academic actions.

According to Coates (2007) and Chen, Robinson and Hullinger, (2008), in research on students' engagement, most times the focus is on face-to-face or campus instructional activities. However, in learning management systems some researchers reflected the association among engagement and outcomes in courses online (Beer et al., 2010) and in social networks (Thoms and Eryilmaz, 2014). For instance, Robinson and Hullinger (2008) used the National Survey of Student Engagement (NSSE) in an online course to examine the differences in the engagement of registered students. The outcomes recommend that differences in engagement are related with learners'

“academic performance, academic major, age, and faculty creating focussed course designs that promote interaction, participation, and communication in the online learning environment” (Robinson and Hullinger 2008, p.107).

Similarly, in many studies of MOOCs, engagement rates were measured by evaluating indicators of engagement like discussion forums, assignments, quiz completion and videos watched (Salmon et al., 2015; Xiong et al., 2013; Xie et al., 2011).

Studies of MOOCs are beginning to examine various activities outlines of students, expecting to create large student groups (Xiong et al. 2014). For example, Kizilcec, Piech and Schneider (2013) observe students in three MOOCs from Stanford University. They categories students it four categories.

- a. Completers (completes most of the task)
- b. Auditing (students attempt few of the task and watch videos)
- c. Disengaging (students who initially engage in the course but stops later.)
- d. Sampling (students who viewed videos at beginning of the course only).

Wilkowski, Deutsch, and Russell (2014) defined other students' groups in to four:

- a. No-shows (Learners who sign up and do not engage)
- b. Observers (Learners who are curious and want to experience online)
- c. Casual learners (Learners who are only fascinated in a subset of the course general)

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d. Completers (Learners who attempt to complete the course).

Additional study by (Hill, 2013) grouped MOOC students in to five:

- a. No-shows
- b. Observers
- c. Drop-ins
- d. Passive participants
- e. Active participants.

Besides, Koller, Ng and Zhenghao (2013) report that in most MOOCs, the instructors' defined retention as a section of students who initially enrol or complete the course a defined standard. Completion rates, they reported is ideal for comparing across a range of MOOCs. However, they further state that when completion is at calculated without considering the range of goals and pattern of engagement, it gives a distorted view. In order for the retention metrics to be valuable, they concluded it should be interpreted and defined taking into account learner's intention.

Studies by Milligan et al., (2013) also examine the forms of engagement and reasons that impact on engagement in a MOOC course. They recognized three different categories of engagement:

- a. Active participation
- b. Passive participation
- c. Lurking.

Additionally, they acknowledged several vital factors that assisted engagement, which includes confidence, prior experience and motivation. While classifying students grounded on students' action outlines is helpful for expressive purposes, Xiong et al., (2014) report that it provides tiny foundation for insights on how a student's motivation can impact diverse course collaborations. The engagement rate in "*Entrepreneurship and innovation MOOC*" metrics include participation (number of times the students participate), page view (number of pages students viewed), assignment (business model of students) and activity volume (the amount of time spent on the platform). Canvas analytics provides these variables as their variable of engagement (Qi and Reid, 2016).

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2.11 MOOCs Retention and Completion Metrics

Apart from the MOOCs' engagement measure, retention is a critical metric measured in this study. Xiong et al., (2014), measure retention in terms of the number of participating days. This will be measured by the first time the learners' viewed or participated in the course and the last day the student engaged. Completion rate is a vital metric that will be measured in this study. Many researchers have proposed several ways of calculating completion rates. For instance, Perna et al., (2014) state that access rates provided a broader understanding of the benefits educationally than using completion. According to Ruby et al., (2015), this gauge identifies that users may access a lecture and assessments several times. Furthermore, they took into consideration the extent users access four forms of instructional resources: lectures; open-ended questions, quizzes rooted in discourses and stand-alone quizzes. Their method provides corresponding weight to different activities that is, accessing a lecture is equal to responding to an open-ended question or trying a multiple-choice quiz. However, Chi's (2009) argues that just viewing a lecture does not involve much engagement as compared to finding the right answer.

Ruby et al., (2015) also define rate of completion as the fraction of registrants gain access the lectures in the final week of a course and denoted them as "lecture completion rates" to differentiate them from assessment completion rate. However, Kizilcec, Piech and Schneider (2013) in their studies, criticise the broad opinion of disengagement in MOOC situations concerning research in attrition and dialogue. In terms of association patterns, based on the engagement, they suggested a grouping method and recognised four classes of engagement:

- "Completing" groups' learners who finish bulk of the course activities and complete the course.
- "Disengaging" describes patterns of students who start the take assignments but stop halfway and browse some content.
- "Auditing" is characterised by students engaging with the learning material and taking assessments but not regularly.
- "Sampling" describes learners who selectively engage with the content selectively.

For this study, the retention rate will be measured in the "number of participating days". This will be measured by "First Access" that is the first time the students viewed or participated in the course.

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“Last Access” regulate the last activities of the students that are, the last time the students saw any content in the course. Therefore, to calculate retention is the number of days between the first and the last day of students’ activity in the course. This retention model was chosen because first, the Canvas analytics provides the first and the last day of students’ activities and secondly the number of days students spent on course has been used on face-to-face courses as retention. Xiong et al. (2014) also used this method of measuring retention in MOOCs.

2.12 Social Networking and Web 2.0 Technologies.

“Social networking sites” expression is commonly used for all social media and computer-mediated communication including Snapchat, Twitter, LinkedIn, Instagram, Facebook, MySpace, Google+, Pinterest and primary social networking sites like Bebo, Cyworld, Meetup and Reddit, Friendster, Youtube, Flickr (Ebizmba, 2016).

“Social network is defined “as networked communication platform in which participants, 1) have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and/or system-provided data; 2) can publicly articulate connections that can be viewed and traversed by others; and 3) can consume, produce, and interact with streams of user-generated content provided by their connections on the site.” (Ellison and boyd, 2013, p.158.)

Often the definition of social media link social media to Web 2.0 technologies that include social networks, video sharing, online reviews, blogs, rating sites and virtual worlds (Krishnamurthy and Dou, 2008). Social media usage through the mobile devices and computer has become popular, the most prominent being Facebook and Twitter (Shah 2018, Zheng et al. 2016; Ventura et al. 2014). Additionally, Zheng et al. (2016) report that Facebook allows users to create their own profile permits users to create their profiles and users can express themselves, build community and make request to other users to join. In contrast, Conole and Alevizou (2010) explain that Twitter enable users to share user-generated content, easily and quickly to large users.

The key social media features according to Skirky (2008: p.10) is that of “*mass socialisation*”, define by Carr and Hayes (2015: p50)

“Social media are internet-based channels that allow users to opportunistically interact and selectively self-present, either in real time or asynchronously with both broad and narrow audiences who derive value from user-generated content and the perception of with others”.

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Also, McCay-Peet and Quan-Haase (2017: p.17) outline the academic purpose and definition: *“Social media are web-based services that allow individuals, communities, and organizations to collaborate, connect, interact, and build community by enabling them to create, co-create, modifies, share, and engage with user-generated content that is easily accessible”*.

Social media in public and academic circles, have become a growing phenomenon. Many educators are increasingly using social media for learning. Many researchers have reported that social media platforms such as Facebook and Twitter permit individuals to practice new skills and means to engage with the process of learning (Ripiyee et al 2018, Zheng et al 2016, Salmon et al. 2015, Fidalgo et al. 2014, Greenhow and Gleason, 2012; Greenhow et al., 2009).

2.13 Web 2.0 Technologies

The term Web 2.0 is credited to O'Reilly (2005) who planned the first Web 2.0 conference in early 2004 in acknowledgement of a new generation of social media tools for business. It has gained extensive use since then, also penetrating the area of teaching and learning (Green et al., 2013).

2.13.1 A Typology of Web 2.0 Learning Technology Tools

Crook (2008); Hew and Cheung (2014); Bower (2017), report the following grouping of activities of Web 2.0 as resulting from a BECTA evaluation of Web 2.0 tools as:

- Media sharing. Generating and exchanging media by reaching broader audiences.
- Media impact and data web mashups. Plan and manage digital media files.
- Prompt messaging and chat.
- Online gaming and virtual worlds.
- Social networking. Social communication between members and the can form subgroups of 'friends'.
- Social bookmarking. Users submit their bookmarked web pages are submitted to a significant site where they are tagged and other can see it.

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- Blogging. A journal that is internet-based that enable users post text and make comments.
- Recommender systems. Websites that joint and tag user favourites for things in domains and making references.
- Wikis and collaborative editing tools. This allows users to unrestricted access to generate, link pages and edit.
- Syndication. Users are able to 'subscribe' to RSS feed which lets websites give notification automatically bring up-to-date or changes in content through an aggregator.

Digital storytelling. By means of multimedia capturing the story of students' learning.

2.14 Social Networking Sites

2.14.1. Facebook

According to Hatch (2018), Facebook had 2 billion monthly active users. It enables interaction, collaboration and sharing among its users, especially peer-to-peer conversation (Idris and Wang 2009; Qmul, 2018). Users set up their profile, with personal and professionals' information, and then they can post links and multimedia from the internet or their content and photos (Facebook, 2018). Facebook also provides an informal and more social learning environment and inspires connection via user friendship request (Ahern 2016; Ataie et al, 2014). Ataie et al, (2014) further stated that by using a social media platform such as Facebook Groups in educational contexts, teaching could be recorded and allows the teacher to observe students' contributions and improvement; the documented proof may permit the teacher to measure the students' contributions.

Also, Ahern (2016); Ataie et al, (2014) report that the Facebook learning experience promote a meta-skill important to technological innovation, cross-cultural understanding, teamwork across disciplines, human progress, in which everybody's skill or experience is equally critical in determining the outcome.

Facebook can encourage shy students to contribute and keeps students engaged in and out of class (Ataie et al, 2014; Baker and Oswald, 2010).

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To further emphasise this point, Baker and Oswald (2010) establish if shy people do profit from internet use. They studied 207 undergraduates on Facebook usage and their shyness and the value of their friendships. The result showed that greater use of Facebook usage was connected with the feeling of satisfaction with friends among those who were shy. In difference, for students not shy, Facebook usage was not connected with opinions of friendship worth. In addition, in the report, Ahern (2016) emphasis that Facebook groups supported group creation of people with similar interest. Ahern noted that in October 2010, Facebook Groups feature was overhauled and re-introduced, and later after six months of this launch, users had made on Facebook, above 50 million Groups.

2.14.2. Flickr:

Flickr is a site that enables users to share a photo, where one's photograph is posted, and comment on and in some cases make use of photographs which is shared by others (Smith, 2018b). It was launched in 2004 and announced in 2018 that free users of the site be limited to store 1000 photos and videos with deleted excess (Hern, 2018). The platform has over 90 million monthly users. An average of 25 million photos are uploaded in the day (Smith, 2018b).

2.14.3. Google+

Google powers Google+ social network—the most important and prominent search engine (Stout, 2018). Due to the increase in search engines, Google+ is one of the more powerful search rankings. Google + has over 2 billion registered users (Stout, 2018). Various reports have also shown that Google Hangout has been used in MOOCs like the one reported by (Fidalgo et al, 2014).

2.14.4. LinkedIn

Linkedin is a social network that links itself with the identities of professional people. LinkedIn carries the most thorough information about users' career history and builds networks with people with common backgrounds. LinkedIn has 546 million registered users. Total number of monthly users is 250 million (Hatch, 2018).

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2.14.5. Meet Up

A meetup is a tool that enable people in their locality to meet up with others with shared interests. In the US Meet Up has been most effective in the US, though it is used somewhere else (Stout, 2018).

2.14.6. MySpace:

In mid-2000, MySpace was mainly the first social network to attain a worldwide breakthrough. Originally established as a way for musicians to freely share their music (also advertise their performances etc.). MySpace developed to incorporate a massive number of users who used it to network with their friends. It has over 100 million users (Smith, 2018).

2.14.7. Ning

Ning platform was launched in 2005 to help businesses or brand minded users develop a website that operates as a social network with community management features. It also permits users to link through the various practical features obtainable on the site, comprising sharing content and negotiated discussions. Users can adapt mostly than on some other platforms, and some services pay for it (Nation, 2018). Ning has 45 million social profile from 224 countries and regions worldwide (Ning, 2019).

2.14.8. Pinterest

Pinterest is currently one of the social media platforms growing in fame. It permits users to gather images online and upload their own, which they then "pin" to themed boards, which can be observed by other site users (Pinterest, 2016). The site has so far accomplished its maximum profile in the US but is progressively common in the UK and Europe; especially with designers and developers. According to Socialmediatoday (2016), Pinterest reached 150 Million Monthly Active Users. (Hatch, 2018) report that Pinterest had reached the milestone of 175 million monthly active users in 2018.

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2.14.9. Reddit

Reddit is a discussion and web content rating website, which permits users post content when they approve, other users, can then rank the content “up” or “down”. It has approximately 330 million registered users and 274 million monthly active users” (Stout, 2018).

2.14.10. Tumblr

Tumblr was launch in 2007 permits users to post content and also see and follow content posted by other users (Hatch, 2018). Most of the users are based in the US, though it also has some European users (It has 158 billion published posts, 396 million blogs and 1.1 billion posts are published monthly (Stout, 2018).

2.14.11. Twitter

Twitter is a “micro-blogging” site, it permits its users to create small, steady statements about their own experience using 280 characters, as well as to point out followers of their newsfeed to other content, commenting and reproducing other Twitter content of which they approve “re-tweet”. Over 550 million users are now registered and 215 million active monthly users. Twitter attained a growth rate of 44%. 34% of marketers use between 2012 and 2014, Twitter for lead generation (Mashable, 2012). According to Statistica (2016) in the third quarter of 2016, Twitter had 317 million monthly active users. In 2018, it had an average of 330 million registered users, and averagely 140 million tweets sent daily (Statistica, 2018).

2.14.12. Vimeo

Vimeo was launched in 2004. Another film-sharing website, Vimeo, has yet to rise to fame compared to YouTube but has a significant following from independent filmmakers in the US and the rest of the world (Vimeo, 2018). It has 80 million registered members and about 715 million monthly views (Smith, 2018).

2.14.13. YouTube

YouTube also offers users the opportunity to comment on and engage with others' social media. Users of the site can rank others content with simple "like" and "dislike" buttons, as well as set up their channels for their content.

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In a single day, over 5 billion videos watched on YouTube (Statistica, 2016). At the end of 2018, report that 1.57 billion YouTube users watch about 5 billion videos on an average day (Hatch, 2018).

2.14.14. Elgg

Elgg is an award-winning open-source social networking software, delivering the building blocks that allow businesses, schools, universities and associations to create their fully featured social networks and applications (Elgg, 2016). It allows users to collaborate, connect, discover and contribute resources and information through their connections. A digital identity is created by users describing themselves and their professional/ research interests. Tags are assigned to content published by the users, and the software connects the user to other learners with similar interests/tags (Socialmediatoday, 2016).

According to Veletsiatnos and Navarrete (2012), students can create their profiles and “friend” lists, follow activity streams, post status updates, and subscribe to be informed of other users’ actions within the environment. Once students logged, the first encountered their dashboards, which they were able to edit by removing features or adding.

2.14.15 Instagram

In their article, de Backer et al., (2007) describe Twitter as a new forum for parasocial collaboration of which Instagram taken a further step. Furthermore, de Backer reported that to most fans, it is more than just a status update from their much-loved celebrities. According to Statistica.com, Instagram had 1 billion active monthly users which was in September 2017 was 800 million (Statistica, 2018).

2.14.16 Social Bookmarking

According to Conole and Alevizou (2010), sites such as delicious gather and joint tags on bookmarks that users have shared. They report that it allows ordered searching focussed on personal tags and 'folksonomy'. Services include letting users to tag, search and share for books they read (livewire, 2018).

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2.14.17 Blogs

According to Du and Wagner (2005), a blog is a personalised webpage, which authors maintain in reverse chronological in the form of a diary. It can be a place for self-indulgence, connection, and self-expression as well as for critical and productive distribution of information. In addition to giving students a social presence (Anderson, 2005). (Macduff, 2009) also report that it be used for revisiting, reflecting and recording upon understandings (Xie and Sharma, 2005). Wheeler, (2009) states that many students who engage in blogging work independently and autonomously outside the influence of any known authority, so it is arguable to what level educational organisations must try to ‘manage’ such learning technology.

2.14.18. Snapchat

The aim of Snapchat that was developed in 2011 by Evan Spiegel and Bobby Murphy was not only to develop a tool planned to publish beautiful or aestheticized pictures, but also to create a place where friends could share funny selfies (Zembriski, 2016). In order achieve this; the solution found was to develop an application where the post content did not last long, vanishing after the visualisation, leaving no future records. The app is composed of the words “snap”, as instantaneous, and “chat”, conversation, became available in September 2011 for download (Zembriski, 2016).

The new feature in Snapchat allowed users to share content, which created a kind of narrative – as it was successively published in sequential order. The image visualization lasts a maximum of ten seconds, but it fades after 24 hours of publication. The stories of a profile generate a kind of timeline on Snapchat, a common feature to other Social Network Sites – such as Twitter and Facebook, which allows the user to navigate and network with others, enabling and stimulating social interactions (Mager, 2013). Snapchat has over 300 million monthly users (Hatch, 2018).

2.14.19. WhatsApp Instant Messaging

WhatsApp Inc. was created in 2009 and bought over by Facebook (Albergotti, et al 2014) by Koum and Acton, both previously of Yahoo (Eric, 2012). WhatsApp prompt messaging service is a smartphone messenger platform that allows users’ network socially. (WhatsApp, 2010).

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WhatsApp have the capacity to send and receive a diverse form of media, such as audio, videos, images media messages (Alabdulkareem, 2014; Bouhnik and Deshen, 2014). WhatsApp in August 2012 exchanged ten billion messages in a day (Olanof, 2012). Smith (2018) reported that WhatsApp had 1.5 billion users and 450 million active daily users. The WhatsApp platform has collaborative features that enables users (including teachers or students) create group to support social interactions.

Amry (2014) examine the influence of WhatsApp usage on mobile learning activities on the attitudes and achievement of online university students engaging with mobile devices. The results showed that the mobile app helped learners to produce a learning community, share knowledge within the group members. Furthermore, they also found that the presence of the online instructor in the WhatsApp facilitated their learning.

Bouhnik and Deshen (2014) also report that WhatsApp groups were used for four primary purposes: communication, making discourse, sharing and building social atmosphere. They also referred to other educational benefits such as the formation of good interactive environment and friendship with other students, which had a helpful impact on the discussion. However, other challenges were technical difficulty, inappropriate messages etc. In other studies, Gachago et al, (2015) report that WhatsApp might increase connection both in online and blended learning context. In this MOOC experimental (Entrepreneurship and Innovation), WhatsApp will be one of the social media that students are anticipated to engage in earlier and through the course.

2.15 Social Media Engagements in MOOCs

The MOOC is comparatively recent and there is little research that deliberates social network integration, even though studies have shown that social networks are used to complement to the course. For example, in the instance of FutureLearn, which is owned privately by the Open University, is assimilating structures, founded on those of social networks, such as the “following” from Twitter, into its platform. Students taking a course on FutureLearn will be able to “follow” a course mate’s comments. The likelihood to add a comment to any posted media or text given in the course and engage in discussion with instructor and other course mates is the same with social networks.

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Fidalgo et al (2014) report that integrating Google + in their xMOOCs improved engagement. Upon the completion of their MOOC, the learning community consisting of was formed of 2,108 individuals in Google+, and five months later, it has 3,109 individuals. This means an increase of 47.5% in 5 months from the completion of the course. They further conclude that the use of social media not only allowed the learning community to maintain its activity but rather to grow it considerably, almost 10 % a month. This indicated that including informal learning activities permits the ongoing of learning activities, even once a MOOC has been completed.

In another study, Ventura et al. (2014) report that in the “Professional English MOOC”, students’ forum, contribution in the conversation topics planned by the teaching team was lower than anticipated. There is absence of quality communication between teachers and students did not give the students opportunity to have a complete learning experience, thus leading to dissatisfaction. In order to resolve the problem, in the second edition of the MOOC, the teaching team decided to use Facebook as an additional space for course discussion.

In a similar study, Swayne (2016) compares students’ use of their MOOC related Facebook groups, course message boards, and forums, and reported that students who engaged more with Facebook groups admitted that they liked networking more on the social media site in comparison with the course forum.

Zheng et al. (2016) report that students' Facebook groups usage on forum interaction within the Coursera site appears to validate Facebook’s effectiveness for student’s engagement. The authors found that there was more students’ engagement on Facebook groups as compared to the MOOC forum discussions, and it produced a better connection within the community. Notwithstanding the clear advantages of Facebook, some disadvantages have been reported when using it for learning. These include distractions, unrelated postings and privacy issues (Hubpages, 2016).

In addition, Zheng et al (2016) *studied the role of Social Media using Facebook in a Coursera MOOCs*. The results show that students were involved more in Facebook groups as compared to forums MOOC discussion. Kizimchuk et al (2016) *carried out a study on where they used Twitter and Facebook to design MOOCs for emotion and community*.

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The studies found that boosting inclusion and community enriched online learning through activities engagement precisely planned to motivate engagement and interaction.

In addition, Liu et al. (2016), in their studies, questionnaires were used to study the usage of Twitter and Facebook as an additional MOOC social space. The Results showed that Social media tools could supplement the experiences in learning by offering a setting for linking with others, resource sharing, increase interaction, and a space to express personal feelings or learning reflections.

Also using ethnographic approach Milligan et al. (2013) examine the engagement pattern in connectivist MOOCs. The studies showed that social media positively affected students in meeting and overall study experience. Furthermore, Jiang and Kotzias (2016) use social network analysis to access the social media usage in Massive Open Online Courses. While Jiang and Kotzias, (2016) report that twitter failed to promote learner-learner interactions because learners tend to form ties with instructors instead of students, Webmann et al, (2014) report that students usage of Wiki-Learnia acts as a search engine for e-learning content and expanded their knowledge on specific topics and improved learning.

Joksimovic et al., (2015); Kop (2011) also use mixed methods to study the analysis of discourse and learning involvements in cMOOC. The results of Kop R., (2011) show that most participants did not achieve these activities aggregation, creation, and sharing. Joksimovic et al., (2015) also report that in regardless of the reading suggestion by instructors, learners instead concentrate on numerous obvious topics that emerged on the course quickly. In addition, in another studies, Pachigolla and Pant, (2016) in studying the impact of WhatsApp in a one-week MOOC reported that WhatsApp helped learners to be active, network and collaborate.

The background review of the social media engagement in MOOCs gives an insight into how other researchers have incorporated Social media in MOOCs. This review is essential because, it will provide an in-depth understanding of the methodological approaches they used, which would help to come up with the appropriate experimental design to suit the study.

2.16 Students Motivation and Online Engagement

Many rapid changes in the learning environment have made educators to study the factors that contribute to online environments that is digitally facilitated (Hartnett and Dron, 2014).

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According to Bekele, (2010) one of such factors is motivation. Motivation defines the reason individual has for behaving in a certain manner in a given means in a given situation. Bandura, (2006) describe motivation as an interior state that inspires, leads, and subtends goal-focussed behaviour. It is also defined as “*the process whereby goal-directed activity is instigated and sustained*” (Schunk, Pintrich and Meece, 2008, p4). It controls if the person will behave in a specific activity (Barak, Watted and Haick, 2016). Learning setting, motivation is theorised as an interior source, which develops, sustains, or facilitates cognitive improvement (Brophy, 2004). It is also hypothesised as the incorporation of cognitive and affecting components that results in intended actions (Slavin, 1987). In addition, few researchers are of the opinion motivation as a character attribute, this method however neglects the point that learners can be motivated, reliant on framework and time (Schunk et al., 2008). Glynn specified several motivational mechanisms that affect learning (Glynn et al., 2011). This includes extrinsic and intrinsic motivation, self-efficacy, personal significance and self-determination. Intrinsic ‘motivation to learn’ according to Duda and Nicholls (1992) and Glynn et al., (2011) involves an essential satisfaction motivated by the emotion that learning is pleasurable and stimulating. Thus, extrinsic motivation involves external aims for learning, such as getting a reward or eluding punishment, grade or good job (Black and Deci, 2000; Glynn et al. 2011).

Cho and Heron (2015) report since motivation is very crucial in online learning, it is vital to discern the effects of motivation on students’ engagement. Cho and Heron (2015) establish that concert is related to online learners' intrinsic motivation. Studies on online learning suggested that an unmotivated student might not use metacognitive and cognitive approaches, example mastery learning (Cho and Heron, 2015). In a MOOC setting, because its free and open and free learning setting, following their goals and interests, participants most times only choose some parts of the learning environment (Kizilcec and Schneider, 2015; Wang and Baker, 2015). For example, Wang and Baker (2015) establish that non-completers seem to be attracted in MOOCs as a kind of learning experience while those who complete the completers are more captivated with the content of the course.

Looking at a larger viewpoint, Kizilcec and Schneider (2015) found that diverse motivational aims (e.g. friends meet up, relevance to the job, career change), may forecast diverse behavioural outlines for MOOC learners.

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Specifically, they found out that learners who joined with friends have a high possibility of engaging with course materials as compared to their colleagues (Kizilcec and Schneider, 2015). In another study, Onah et al., (2014) state that learner expectations play a role in motivating them and in the condition where their aims is not attained, it can lead to course drop out.

In the preceding conversation on motivation, motivation can be a precondition of learner engagement. For instance, Hartnett and Dron, (2014) report that way, either students' motivation or engagement are strictly connected features of student learning that can be impact on their learning outcomes. Beer et al., (2010) also state that even though there is no generally recognised definition of what contains engagement, students' and college success, students' retention and students' motivation are always related to participation.

Likewise, in the MOOC setting, Xiang et al., (2015) report that based on preceding literature, they proposed that motivation of MOOC learners encompassed three aspects: extrinsic, intrinsic and social features. Furthermore, they stressed that social motivation comprises students' emotion linking with peers. This relates with the view of "social presence," which has been studied (Gunawardena and Zittle, 1997; So, and Brush, 2008). For instance, using survival models, Wen, Yang, and Rosé, (2014) found that students' motivation, calculated by the proportion of post weekly and cognitive engagement, calculated by the level of language theory in forum posts, were important prediction of dropouts. The outcomes according to Xiong et al., (2015) recommend that social connections, which occurs in discussion forums in MOOCs, affect motivation of students to continue in the course or drop out.

Additional studies have shown how motivation can absolutely affect learner performance. For instance, De Barba, Kennedy and Ainley, (2016) recognise that motivation has a major influence on learner involvement. Furthermore, the authors used video hits and attempts quizzes as a learner's measure of involvement. The results showed learners who finished the course incline to be intrinsically motivated. Also, in another study, Shapiro et al., (2017) report that interview transcripts of participant sentiment analysis used within the Coursera platform stated that the main factor that impacted on learner experience was motivation levels. For example, they found out that, learners with high engagements attained higher educational of education as compared to those with less formal education (Shapiro et al., 2017).

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In conclusion, Xiong et al., (2015), Beaven (2015), and Watted and Barak, (2018) note that there are quite a number of researches done on students' motivation in traditional learning and higher education settings. Nevertheless, Xiong et al., (2015) emphasize that the study of students' motivation in MOOCs remains thin in spite of the research showing that students' motivation is essential to initiate and endure behaviours needed to accomplish learning objectives.

Therefore, Huang and Hew, (2016) highlight that it is crucial to gain students' motivation level in e-learning situation as instructors can implement critical approaches to increase students' engagement and learning. They concluded that in MOOC settings, absence of hypothetical research on measuring learners' motivation level is lacking. This conclusion is also related to that made by Jiang and Kotzias, (2016) that study is required to realise learner motivation and how instructional designers can support to increase their involvement and engagement. Hakami et al., (2017) also in their studies, which were aimed at presenting an extensive evaluation of associated literature on the issues that affect motivation of learners in MOOCs, recommended that the relationship between motivations of learners and course retention or completion be studied in future.

2.17 Learning Analytics

In 2011, the Society for Learning Analytics and Research, defined learner analytics as to the measurement, gathering, examination and reporting of learners' data and their backgrounds, with the purpose of thoughtful and refining the of learning environment (Khalil and Ebner, 2016a). Additionally, learning analytics, can develop learning practices by changing the way we subtend the process of learning (Mavroudi, 2018). Distance online learning settings, like MOOCs, offer a rich data source to mine according to (Khalil and Ebner, 2016b; Cronenweth, 2013). Therefore, Khalil and Ebner, (2016a) emphasise that by logging mouse clicks, frequency of login, forums activities, taking quizzes, and time expended on activities and tracing interactivity of videos. Learning Analytics researchers can form a massive volume of data logs (Khalil and Ebner, 2016); Such the database information according to Khalil and Ebner, (2016); Keshavamurthy and Guruprasad, (2014), helps researchers from diverse disciplines to affect directly toward students' success. In addition, Scanlon, McAndrew and O'Shea, (2015), report that learning analytics and design to a huge extent work in a similar manner.

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They further emphasised that research on learning analytics can select areas of problematic areas and stimulate interventions to increase retention and activity the influence of diverse sustenance replicas. However, it was stressed that these could only be carried to other settings by following the influence of teaching interventions as the reviewed design of learning on the outcomes of students.

In regard to MOOCs, from all over the world millions of students' register. MOOCs learners are not only considered as learners, but they are also producers of data according to (Khalil and Ebner, 2015). Furthermore, researchers like (Moissa, Gasparini and Kemczinski, 2015; Vogelsang and Ruppertz, 2015; Kloos et al, 2016; Ruipérez-Valiente et al., 2016) stated that there is a low research in the area of learning analytics in MOOCs.

However, there are a few backgrounds, according to Drachsler and Kalz (2016), which connect both learning analytics and MOOCs. One of the few structures is the introduction of a conceptual framework that provides the relationship between learning analytics and MOOCs, called the MOOC Learning Analytics Innovation Cycle (MOLAC). Their framework consists of three levels: micro, meso and macro levels (Drachsler and Kalz, 2016). The macro-level represents interventions of learning and teaching. In addition, the works of Alario-Hoyos et al., (2016) gives an example of the micro-level of the MOLAC structure where learning analytics activities and data collection are concentrated on reflection and expectation. In the case of meso level, Drachsler and Kalz, (2016) report that the data from numerous open courses are joined to withstand bench making and give more insights about groups' learner behaviour rather than an individual.

In conclusion, Khalil and Ebner, (2016a) reported some of the benefits of Learning Analytics in MOOCs, enhancing engagement, cost savings, benchmarking and personalisation (Khalil and Ebner, 2016). Additionally, Fergusin and Clow, (2015) report that learning analytics provides a method for generating factors influencing retention, which lets MOOC providers make adjustment of the context of learning, design and pedagogies and the vast datasets collected in MOOC activities offer strong support for this technique. However, Khalil and Ebner, (2015b) and Gasevic, (2015) also report the challenges of learning analytics such as privacy issues, ownership, consent, transparency and security.

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In this study, data on course engagement and retention will be obtained from the Canvas dashboard. The Canvas analytics defines students' engagement as the "*Course Access Report*" which is located in the *People* section of the course dashboard. The course access reports show summaries of students' participation in the course (assignments, quizzes, discussions, the content they viewed, the number of times the user viewed the content, total percentage of participation in the course, and total activity- time spent) (Qi and Reid, 2016). These variables will be used to calculate course engagements and the number of day's students spend on the course (retention) (Ripiyee et al., 2017).

2.17.1 Social Media Analytics

According to Dunham (2014), while social media networks offer diverse forecasts for engagement, numerous methods are used to measure engagement. The aim, according to Hollebeek, Glynn and Brodie, (2014), is to capture consumer behaviour and actions outside the act of viewing content. These methods consent that achievement on social media platforms such like Facebook is "*not primarily a matter of several fans.*" (Date+ page) Activity is more vital: "*likes, comments, and shares are the fuel of vitality*" (Eyl, 2013, p.1). Therefore, engagement of user with content on a social media platform is "*likely to generate commitment,*" loyalty brand, and replicated business (Hoffman and Fodor, 2010, p.46).

While social media networks provide diverse prospects for engagement (Dunham, 2014), a common approach is used by many to evaluate engagement. Beyond the modest action of watching, Hollebeek, Glynn and Brodie, (2014) emphasize that the goal is taking participant activities and behaviors outside the act of simply viewing content. Also, in relating the Engagement Rates to MOOCs, Ruby et al., (2015) point out that measures of engagement in social media are not as complex compared to principles established to comprehend in on-campus courses involvement and online courses. However, they argue that relating the simple theories of social media engagement measurement to MOOCs may offer valued understandings into the actions of MOOC users.

In this study, the number of participants and posts in social media forums will be measured as the social media engagement. The focus group study of the WhatsApp will involve collecting data on the number of learners, post, links and images.

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According to Young and Bruce, (2011), previous students in online learning emphasises the importance of collaboration within the community of learners as they engage with each other and participate in course activities. Richard (2013) also report that as students engage with each other, student's motivation generally increases. Tillery (2014) also said that one of the methods of measuring motivation is indicated by students' involvement in an activity and collaboration with each other. Motivation is essential for retention, and absence of motivation is one of the significant explanations of drop out in MOOCs (Khalil and Ebner, 2014).

2.18 Challenges in Incorporating Social Media in MOOCs

Social media according to many researchers stated that social media offers consistent learning settings for Massive Open Online Courses (MOOCs) that influence or motivate involvement, engagement, and support peers (Zheng et al., 2016; Veletsianos, 2017). Though the aids social media users in the online situation, challenges been reported when using social media in MOOCs.

For instance, Veletsianos (2017) examine 116 MOOCs that used Twitter with hashtags dedicated to the course. They then considered users' contribution outlines, the use types of hashtags posting, the forms of posted tweets, and the alteration in groupings of posted tweets across the users. These findings do not disclose a vivacious suggestion of contribution of learners to numerous hashtags, which recommend likely that learners didn't find Twitter to be a valuable space that delivered advantages to their needs. Therefore, according to Veletsianos (2017), these outcomes prove the necessity for more important efforts in integrating social media alongside with MOOCs.

Tarantino et al., (2013) recommend that educators who wishes to incorporate social media in their courses to motivate students learning out to assist students and be vibrant learners in the group learning community. Furthermore, they suggested that students who are not too familiar with social media would require closer management and direction (Jackson, 2011). Also, some researchers have highlighted that educators out to identify the prospects for disruption, over-stimulation and to cyberbully that is related with definite groups of social media together with more broad problems of supporting privacy and protecting data of users (Chen and Bryer, 2012; Hurt et al., 2012).

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In addition, in their studies of exploring the effect of social media on MOOCs, Salmon et al., (2015) suggest five recommendations for MOOC designers who wish to integrate social media into their courses. Firstly, they emphasized that social media preferences should be considered while developing or designing for MOOCs participants.

Secondly, they stressed that the content development and distribution approaches for the targeted viewers should study the group's background, demographics, and use of MOOC-centered research. Therefore, they reported that such forecasters help in selection of platform, established on demographic data and social media usage.

Thirdly, they recommend that social media should preferably help corresponding purposes to a Learning Management System, confirming no reproduction of material.

Fourthly, they stress that learners should be knowledgeable, and that social media communication is not replicated within the course/official platform.

Fifthly, they recommend that MOOCs should be basic as many MOOC participants could be busy with their jobs and lives.

2.19 Summary of the literature review and justification

This aim of the research is to examine the impact of social media engagement on students' motivation in MOOCs. Background literature was conducted to provide a descriptive, summary and critical evaluation of the research study concerning the problem of the research investigated. The chapter has provided a discussion regarding the evolution and development of MOOCs over the years, the pedagogy of MOOCs, explaining MOOCs' mode of delivery and their differences, which was essential to understand the dynamics of the cMOOC and xMOOC environments. According to Mackness (2013), a cMOOC climate is dynamic and continuously changing where students cannot replicate the behaviour of the instructors. In other words, they have to self-organise their studies, as opposed to an xMOOC in which the approach is more of a transmission model of instruction. Understanding the pedagogical background of the MOOCs, will help in the experimental design of the MOOC in chapter 4.

The literature reviewed also discussed various MOOC platforms and explains how MOOC delivery approaches benefit learners and how they generate an environment that contributes to personal and professional development.

CHAPTER TWO - Literature Review

It is also essential to discuss typology of web 2.0 technologies and the theories that underpin interactions with web 2.0 technologies because according to Enunbon, (2010); Livingstone, (2015) teaching and learning are being transformed significantly in higher education by the use of Web 2.0 technologies. In addition, Enunbon, (2010) further report that universities and colleges are speedily embracing these technologies and using them to not only enhance their traditional curriculum but to cover course offerings outside the college campus. The chapter also reviewed the social media technology and social learning theory concentrating on how the application of social media with online learning have been used in the past to stimulate collaboration, motivation and gaining of knowledge.

Other reviews also discussed the typology of web 2.0 technologies, students' motivation and online engagements, social media engagement in MOOCs and challenges in incorporating social media in MOOCs. The review of literature in this study will inform the research question to be investigated in section 2.20 and provide a sound basis for making connections with the results and findings in the discussion and conclusions.

Also, since the current conception about social media usage in MOOCs is still developing, the research needs to look at the existing theories and concepts that underpin social media and online learning. The aim being to get a deeper understanding of the theory of connectivism on which this research is based. Discussions about the learning theories and how they relate to social media will assist the conversations about the pedagogy behind how students learn with social media (Selwyn, 2010). According to Hine (2000), the purpose and use of technologies arise in the settings of how individuals use them, and purposes may differ based on how individuals view social media to be essential and suitable. Therefore, it is critical to discuss how social media are used and how they influence students learning. To get more knowledge and understanding of the problem of low completion and student's motivation, which is critical in this study, additional literature about engagement with social media in MOOCs and learners' motivation, was reviewed.

In addition, the investigation of the current literatures led to the additional literature review on different types of motivation, how other researchers have measured motivational influence on learners' performances.

CHAPTER TWO - Literature Review

This review provides a deeper insight and knowledge of the role motivation plays in sustaining students' learning and completion in an online setting, thus leading to the core of the study of examining "*how engagement on social media would impact on student's motivation*". This idea led to the refocused research question. A discussion of the process of developing the research question and its refinement is provided in the next section.

2.20 Development of the Research Question and Justification

The literature reviews show several studies on the problem of high attrition in MOOCs (Jordan, 2015; Bacon et al., 2015; Onah et al., 2014). Researchers have recommended solving the problem of attrition by social interaction, which they suggest, is necessary for sustaining learners in online courses (Saijing et al., 2016; Fidalgo et al., 2014; Yang et al., 2013). During the literature review period, the faculty happened to be running a MOOC "Entrepreneurship and Innovation" which was an EU/Lifelong Learning Programme Centralized funded project in 2015, alongside this research work. The EU partners in the project, which involved the supervisors of this PhD, offered the MOOC through the Canvas VLE. The MOOC approach was student-centric but had no course social media engagement; students independently worked through the course materials and used the course forum for interaction.

The results of the first MOOC, as report by Bacon et al., (2015) show that 1581 signed up to take the MOOC. Out of which, 804 registered, but did not started the course (51.7%) which according to Onah et al., (2014), Jordan (2015) is typical of most MOOCs. Furthermore, reports show that 752 attended at least once, and 572 stopped using the MOOC after three weeks (Bacon et al., 2015) (detailed explanation of first MOOC in 4.5.1). This result is typical of many MOOCs in that it is easy for students to sign up for a free MOOC, however about half of them are unlikely to retain the motivation to start the course (Bacon et al., 2015; Onah et al; 2014; Saijing et al., 2014). Besides, the first two weeks of a MOOC are the most critical as attrition is at its highest during this period (Jordan, 2015). From the results of the first MOOC and literature review, there is sufficient evidence and justification to support more investigation on topics relating to designing a MOOC that engages students on social media before the start of the course and during the course period. The anticipated outcome is that a student's engagement on social media will help built momentum and a sense of community among students before the course starts and during the course period, which is vital to retain students online.

CHAPTER TWO - Literature Review

Therefore, this will involve collecting data on a learner's motivation both at the point they sign up for the MOOC, and during the running of the course. This understanding has led to the development of the initial research question, as stated in chapter 1:

“Can engagement with Social Media as a support interface within a MOOC affect learner's motivation?”

From the literature review, it was clear that the research question was too broad and needed greater focus to ground the question in the research. Therefore, to have a more deeper understanding of the problem of low completion and a student's motivation, additional research regarding engagement with social media in MOOCs and learners' motivation was carried out. A new understanding of the impact of social media engagement on learner motivation in MOOCs after the literature review and results from the first MOOC, lead to a review of the research question.

Therefore, the concept of *“Can engagement with social media”* replaces *“what are the impacts of social media”*. According to Lynch (2018), when it comes to measuring the impact of digital learning, there are several metrics one should be focusing on which includes outcomes, ease of use of platform and feedback. Besides, Guskey (2018) recommend that measurements should include participant's reactions to learning materials, acquisition of new knowledge and learning outcomes. Thus, looking at the *“impacts”* will enable the study to examine some of the factors that can influence or affect learners' motivation. Chapter 4 outlines the details of the measures.

Therefore, *“impacts”* denotes the impacts of social media *“on students' motivation”* and how their motivation affects *“course engagements/retention in a MOOC”*. Hence, the redefined main research question as:

What is the impact of social media engagement on learners' motivation in MOOCs?

2.21 Refined Aims and Objectives of the Research

Because of adjustments to the original research question, below are the research aim and objectives.

CHAPTER TWO - Literature Review

Aim: To find out if the incorporation of social media alongside a MOOC can have an impact on learners' motivation, course engagement and retention”.

2.22 Objectives to answer the research question

- To find out if early participation in social media increases the number of students who start the MOOC from those who have registered.
- To find out how motivated students are while engaging in social media interactions during the course.
- To find out the relationship between motivational factors (intentions) of social media participants and completion.
- To find out if there are significant differences in course engagement between students who engaged in social media and those who did not.
- To find out if there are differences in retention between MOOC students who engaged in the course social media and those who did not.
- To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC.

2.23 Section Summary

This section revisited the research question after the review of the literature (i.e. *what is the impact of social media engagement on students' motivation in MOOCs?*) and robust recommendations were obtained from the literature to generate a series of strategies to answer the research question.

Chapter three outlines the methodology to answer the research question. It explains the instruments used to collect data to answer the research question.

CHAPTER 3

RESEARCH METHODOLOGY

Having revised the research question in the previous chapter, research methodology designed to answer the research question is outlined in this chapter. In addition, how the research aim and objectives is discussed. The chapter discusses why questionnaires and data analytics is used for data collection. The justification behind the research question and how it meets the research objectives are also discussed in this section.

3.1 Connectivist Combined With A Quantitative And Qualitative Method

The ultimate goal of this research is to examine the impact of social media on students' motivation in MOOCs. To achieve this, it is necessary to steer this study through the spectacle of a hypothetical research method to evaluate students' motivation as they engage in social media and how it affects their course engagement and retention. According to Anders (2015), connectivist MOOCs (cMOOCs) are designed in such a way to create network effects for learning. Also, Anders report that the virtual liberty of participants and the MOOCs openness allow these connections without any intrusion from the centralised authority. Downes has reason that connectivist learning is grounded on four main ideologies: "*openness, diversity, autonomy, and interactivity/connectedness*" (Milligan, Littlejohn, and Margaryan, 2013: p150).

Therefore, this research seeks to further build on these studies, examining the impact of social media on an "*Entrepreneurship and Innovation*" MOOC, using a method (mixed method MMR), to develop a greater understanding of the student's motivation within a cMOOC course. Raffaghelli et al., (2015) examine the methodology most commonly adopted in MOOCs. They report that many researchers took a "Mixed Methods" research to study the profile of learners', their actions, motivation and activities through and after their MOOCs involvement, and their view around pedagogical practices. Moreover, they report that the surveys comprised mostly of a multiple-choice set, closed questions but sometimes also involved open-ended answers. Mixed methods research, according to Johnson and Onwuegbuzie, (2004), specifies a research model where the researcher combines qualitative and quantitative research methods, techniques, ideas, into one study. In mixed methods, research offers the opportunity to validate the use of several methods in answering research question, rather than limiting researchers' choices (Creswell, 2009).

CHAPTER THREE - Research Methodology

Additionally, Creswell defines MMR as a method of incorporation the outcomes of qualitative and quantitative data analyses for seeing the problem from numerous angles and several viewpoints.

In this research understanding “students’ motivation while engaging on social media” and its impact on “course engagement and retention” are the main goals. Considering this study, there are three critical reasons for combining both quantitative and qualitative research methods. First, motivation, which is a difficult and multifaceted theory - have been studied broadly in psychology, education and other fields (Hartnett, et al 2014). In education, learners’ motivations is a vital factor affecting learning behaviours, attitudes toward learning, academic performance, retention, time and motivation (Hartnett and George, 2014;2016). Given the preceding, in measuring motivation, capturing data using both qualitative and quantitative methods according to Driscoll et al (2007) argues, would furthermore provide a better understanding of statistical analysis and survey responses can offer a comprehensive assessment of response patterns.

Secondly, (Bryman, 2012) report that triangulation of qualitative and quantitative data helps to sustain reliability by enhancing the integrity of findings, gives a more wide-ranging account of the phenomenon, and increases validity and reliability of the research. Clark and Creswell (2008) also report that it could also result in higher confidence in findings. Moreover, thirdly, mixing both methods helps better create the meanings and enhance interpretations of the issues that developed during the data analysis (Johnson and Onwuegbuzie, 2004).

As deliberated in Chapter 2, one of the major problems in a MOOC, is the low completion rate and motivation of students. According to Cho and Heron, (2015), online learning studies show that students who are not motivated might fail to use metacognitive and cognitive approaches, such as self-monitoring and mastery learning. In the setting of MOOCs, since it is an open and free learning environment, and registering is simple, participants have a tendency to select only to participate with sections of the learning environment, following their interests and aims (Kizilcec and Schneider, 2015; Wang and Baker, 2015). For example, Wang and Baker, (2015) found that non-completers have a tendency to more interested in MOOCs as a type of learning experience, whereas course completers have a tendency to be more fascinated with the course content.

CHAPTER THREE - Research Methodology

In a broader viewpoint, Kizilcec and Schneider, (2015) report that diverse motivational goals (e.g. career change, job relevance, developing new friends), may expect various behavioural outlines for MOOC participants. These results were not too different from the findings in the first Entrepreneurship and Innovation MOOC that ran in May-June 2015. The department ran the MOOC for a European research project alongside this research work. The design MOOC was student-centric, and the expectation was that individual students would go through the course material and form groups on the course forum. However, the completion rate was similar to the norm of less than 10% (Bacon, et al 2015). Bacon et al., (2015), report that 1556 sign up to take the MOOC. Out of that, 804 registered but don't started the course (51.7%), this is characteristic of most MOOCs (Onah, 2014). From the preceding report, it is evident from the research that about half MOOC students, who register, never start the course. This report agrees with the statement of Jordan (2015) who state that about half of a MOOCs' students who registered would not start and that the first two weeks of a course appears to be serious in achievement student's engagement. Therefore, the design of the second MOOC is (as shown in figure 3.1) is different because of the low start-up and retention in the first MOOC.

The issue of retention does not just start when a MOOC starts; its begins from the point of registration. Like Jordan (2014) report that most students who sign up for free MOOC don't start, even getting students to the starting block is a challenge, and therefore the aim is to see if social media can assist and can support the two critical stages of MOOCs, i.e. from registration to course start and from course start to completion.

3.2 Pre-MOOC

The pre MOOC period aims to inspire learners to be a dynamic part of a social network such as Facebook, Google Hangout and WhatsApp from the point of registration. The expectation is that it would stimulate interactions, the exchange of ideas and warm-up students before the start of the MOOC.

3.3 MOOC period

Students would interact on social media throughout the MOOC period, but the course forum would be the official forum for interaction on anything related to the course.

CHAPTER THREE - Research Methodology

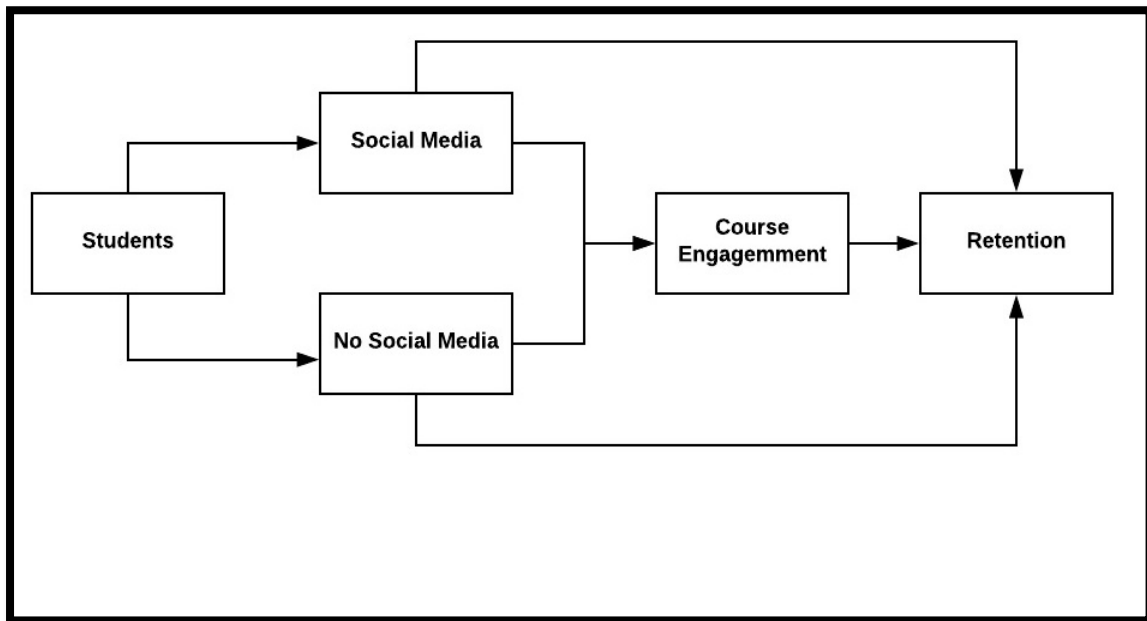


Figure 3.1: Conceptual model of MOOC

The diagram above Fig 3.1 is a theoretical model of the MOOC course and engagement on social media. Students who sign up for social media before the course are expected to engage in it and throughout the course period.

To measure the effect of social media on students' motivation, it was required to assess motivational levels of students' who join social media at the point of registration and to find out if their early engagement motivated them to start the course.

As a result, the following objectives are developed:

1. To find out if early engagement in social media increases the number of students who typically start a MOOC, once registered.
2. To find out how motivated students are in engaging in the course social media interactions during the course.

The second aspect of the research question relates to students' intentions and how it affects to completion. According to Koller and Ng, (2013), when measuring retention in MOOCs, the intent of learners should be considered, especially taking into consideration the varied motivations and backgrounds of enrolled students.

CHAPTER THREE - Research Methodology

The low retention in MOOCs is often reasonable when viewed in this context, which has resulted in the development of the following objectives:

3. To find out the relationship between motivational factors (intentions) of social media participants and completion.

The third aspect of the research question is related to course engagement, retention and completion. As stated in the literature review, Young and Bruce, (2011), report that preceding studies in online education stressed the significance of social collaboration within a group of learners involved together in course activities. In their research Morrison, (2016) recommend that if students in online learning environments will likely participate with peers on social platforms, like Facebook, it's valuable to examine additionally how incorporating social media to engage students, develop their learning experience. Therefore, this area justifies further investigation. However, there is no empirical evidence to show the comparison or differences in course engagement and retention between those engaged in social media and those not involved. Building on this point, it is proper to measure the differences in course engagement between the two groups of students. To answer the research question, below are the created objectives:

4. To find out if there is a significant mean difference in course engagement between MOOC students who engage in social media and those who do not.

5. To find out if there is a significant mean difference in retention between MOOC students who engage in social media and those who do not.

The fourth and fifth aspect of the research question relates to obtaining data to compare course engagement and retention of those engaged in social media and those not engaged.

The sixth objectives involve obtaining the qualitative data from the survey and Focus Group study

According to Qualitative Research, the design of the methods is in such a way that it reveals the behaviour, actions, perception, and interaction with others of the targeted audience (Crosmann, 2019; Kawulich, 2004). The methods are more communicative and descriptive, thus making it easier to understand, and inferences can be quickly drawn from the data.

CHAPTER THREE - Research Methodology

Other forms of qualitative methods are in-depth interview, ethnographic research, content analysis, case study research and focus groups. The data collection would be from surveys and focus group study.

The data would be extracted from the motivation questionnaire, which is administered through a link to Smart Survey. Using the 5 phase guidelines suggested by Braun (2006), the thematic analysis would be used to code the students' response data. This includes familiarising oneself with the data, reviewing themes, searching for themes, generating codes, defining and identifying the themes and creating the report. The choice of using thematic analysis is because it captures the significant features of the data as it relates to the research question, and in the responses, it gives some level of meaning and pattern within the set data (Braun, 2006). Therefore, to meet the research objectives and answer the research question, the following objectives were created:

6: To find out the benefits and drawbacks of the MOOC learners engaging in social media forums.

From the preceding, the research objectives listed above aim at answering the research question of this study. The experimental design of the research and how data would be answering the research question is described in the following chapter.

3.4 Focus Group Studies

According to Nagle and Williams, (2014), focus group studies offer a more in-depth understanding of the way people think, and the phenomena studied. In another definition, Focus group research is “*a way of collecting qualitative data, which mainly involves engaging a small number of people in an informal group discussion (or discussions), 'focused' around a particular topic or set of issues*” (Wilkinson, 2004 p. 177).

According to Nyumba et al., (2010), focus group discussions, at any stage of the research is a multipurpose method, and it is flexible. Furthermore, Nyumba et al., (2010) also emphasise that compared with traditional techniques, like surveys and individual interviews, a focus group communication provides a prospect to explore matters that lack a clear understanding of the research topic.

CHAPTER THREE - Research Methodology

Focus group deliberations also shape on dynamics of the group to investigate the problems in setting, details without implementing a theoretical outline as associated with an organised interview of individual (Nyumba et al., 2010; Breen, 2008; Onwuegbuzie et al., 2008).

Many researchers have also reported these details in focus group such as the methods of sharing, matching views and understandings indicates that the focus group discussions can produce additional understandings than equal numbers of individual interviews. The benefits of such, according to Nyumba (2008), can be huge since it offers understanding into social relationships, and the data acquired reveals the social and interrelating nature of understanding more than an individual description through surveys and interviews. Therefore, Breen (2006); Nyumba (2008) advise researchers to be aware of this constraint if used alongside mixed methods to conclude the focus group research.

Researchers have also used social media focus groups during MOOCs. Lijadi and Schalkwyk (2015) report on his study on focus group using Facebook was beneficial. Some of the benefits mention includes natural recruitment and interaction with participants. It was also easy to collect data by different means of communication like text, photos, songs, video clips, emoticons and links for data analysis. Ventura et al., (2014) also studied 70 university students' journeys on the Facebook focus group for 22 weeks. The study defines the extent that university students use their social learning network for academic's purposes. The findings suggest that results from social network studies could be harnessed to improve students' experiences.

3.4.1 Reasons for Choosing WhatsApp as a Focus Group.

Studies have shown that researchers have used interactions on social media for focus group study, for example, Vivian et al., (2014), conducted a focus group on the learning of undergraduate students on Facebook. In regard to learning with WhatsApp, Amry (2014), Gon and Rawekar (2017) report that students at the universities and majority of higher institutions are using mobile communication and instant messaging for educational purposes. In addition, in their studies on using the diverse prompt messaging platform in education, it reports that these apps have abilities to intensify learning (Smit, 2012). Bouhnik and Deshen (2014); Church and de Oliveira (2013); Nguyen and Fussell (2016); Mbukusa (2018) also state that within the scope of learning, WhatsApp could be a useful tool anywhere, anytime and for collaborative learning.

CHAPTER THREE - Research Methodology

Furthermore, Cetinkaya (2017) also recommend in their studies more research on the impact of WhatsApp use on education development.

The study decided to use WhatsApp group as a focus group because first, among the three social media platform, Facebook, Google Hangout, WhatsApp was the most active in terms of post and number of participants. Secondly, research has shown that at the study period, the use of WhatsApp in MOOCs was relatively new (Ripiyee et al., 2018). Thirdly, as reported by Nagle and Williams, (2014), surveys mostly entail closed-ended questions and that may restrict the response acquired from a respondent. Focus group allows the researcher the ability to obtain deeper information to supplement surveys.

The focus group will provide the opportunity to get a deeper understanding of how students perceived their use of WhatsApp and obtain in-depth insights and qualitative data to answer question 6. Another aim of the focus group is to offer a prospect for students to explain how WhatsApp influences their learning and to harvest additional qualitative data to answer question 6. (*What are the benefits and drawbacks for using social media in the course?*).

3.4.2 Focus Group Methodology and Justification

As reported by Nagle and Williams, (2014); Breen, (2006) the primary phase in guiding a focus group is to describe the aim of the study. It is essential as it describes how all consequent actions will progress.

Nagle and Williams (2014); Vivian et al., (2014); Breen (2006); further gave the examples of some benefits for a focus group which includes systematic research, exploration, finding important issues from the target group, data collection enables one to get in-depth on specific research questions and evaluation.

The data for this study will be harvested from the WhatsApp platform responses of the MOOC participants during the MOOC period as related to the survey questions. This chosen method allows for an in-depth examination of the research question as revealed by the qualitative data responses (Salmon et al., 2015; Breen, 2006). Other conventional methods used by researchers include one-to-one interviews (Breen, 2006). The technique involves interviewing individuals to investigate individual experiences, which, according to Breen (2006), encourages self-reflection on matters that could be difficult if the individual is under social pressure.

CHAPTER THREE - Research Methodology

However, Breen (2006) emphasise that the benefits of focus groups over the one-to-one interview technique is that, a focus group is far more suitable for idea generation within a social context.

Furthermore, Breen (2006) and Vivian et al., (2014) also report that in focus groups methodology, there are the social formation of attitudes and opinions and focus group provides the environment which to articulate them. Some other benefits are it gives a deeper understanding of the phenomenon, and its supplements and further describes statistical information acquired from other assessment procedures. Despite the benefits, researchers have also mentioned the challenges of the focus group methodology. Breen, (2008) report that a focus group could be time-consuming than quantitative evaluation process, reliability of thematic analysis and the perception are context specific.

The survey consists of two questions. Reason being that first, the survey covers two aspects. 1. The reason for the choice of WhatsApp and the impact it has on their learning. The survey participants will be allowed to respond to the questions during the last two weeks of the course to enable students enough time to share their experiences.

3.5 Summary

The experimental research approach in this chapter have been identified as a mixed methodology. The chapter also explains the choice of mixed methods in the cMOOC. The outlined research question of the study is broken down into objectives to explore different parts of the objectives individually. The next chapter explains the planned designed instruments for data collection to answer the question, having covered the research method and clarified the research objectives. The chapter also explains the justification behind each objective and its relationship to the research question. Furthermore, the course engagement and retention/completion metrics and how it will be harvested from Canvas dashboard analytics and steps to statistical analysis are discussed. Lastly, it gives an overview of the focus group design.

CHAPTER 4

EXPERIMENTAL DESIGN

The vital aspects of this research, which is the experimental design of the studies (MOOC design) is described in this chapter. This chapter first describes the design of the questionnaires and how they will be used to get data to answer the research question. The ethical matters in the studies are also described. In addition to these, the research hypotheses and categorises is outlined in this chapter. The experimental variables (i.e. dependent and Independent variables) in the studies. Lastly, the validity and reliability of the study are also discussed in this chapter.

4.1 Reasons for the Choice of Experimental Design and Justification

This section describes the research and then summaries of the experimental studies structure. As outlined in Chapter 2, section 2.20, the purpose of the research question is to examine the impact of social media engagement on learners' motivation in a MOOC. The results from these studies will provide analytical data to decide if social media engagement influences course engagement and retention. To achieve this, the research investigates the use and subsequent impact of social media engagement in MOOCs and experiences of students to meet the objectives of the research question.

As earlier stated in chapter 2, the study discusses an in-depth literature review of what other researchers have done with regard to using social media in MOOCs, methodologies, approaches and results. Most researchers who used use social media in MOOCs, shared students' experiences. None of these studies has used a mixed methodology coupled with a focus group to compare students who engaged in social media and those who are not. The comparison in terms of course engagement, retention and completion of the two groups, those not involved in social media serving as the control. Therefore, the experimental design is based on this background of the reviewed literature, baseline data from the first MOOC, and research aim, which is to conduct the experiment and harvest data to answer the research question.

The experimental design of the studies aligns with the Post-test Only Non-equivalent Group Design using a Comparison Group (Creswell, 2009; Leardstatistics, 2018).

CHAPTER FOUR - Experimental Design

In this design, participants in one group are exposed to a treatment (an explanatory variable influenced by the experiment), a non-equivalent group is not exposed to the procedure, and then the two groups are compared (Creswell, 2009).

In this study, the social media group are the ones that gets the treatment (that is engaged on social media while the non-social media group serve as the control group). Under the Quasi-Experimental design, there are other techniques like pre-test/post-test; non-equivalent groups design (Krishnan, 2019). In this method, the data is analysed before and after treatment (Dimitrov, 2003). It is a between-subjects design in which participants are not randomly apportioned to conditions. However, the post-test only non-equivalent groups design involves measuring treatment (samples that receive intervention) of the samples. In this study, the post-test only non-equivalent groups design is chosen because of 1. There are two groups (social media and non-social media - between-subjects) 2. No random selection for social media participants, but the students choose to engage in any of the social media platforms. 3. Measurement is taken after the engagement on social media. Therefore, the post-test study fits into the experimental design as there are two groups, not randomly selected, and only one group gets the treatment, that is engaging in social media. The non-social media group serves as a control. Another reason for the choice of the experimental design is the benefit reported by other researchers like Krishnan (2019), state some of the benefits of the post-test only non-equivalent groups design. 1. The design is used in a natural setting and is less complicated, and error propagation is generally low. Also, Reneski, (2017) report the inclusion of a comparison group, even one that is not randomised, helps to rule out some internal threats to validity.

The principal aim of this research is to evaluate and examine the impact of social media on students' motivation in MOOCs. To accomplish this, it is important to guide this study through a hypothetical research method to evaluate learners' motivation as they engage on social media and how it affects their course engagement and retention.

Therefore, to answer the refine research question, a questionnaire was designed to obtain data to answer the research question. The next section focuses on the questionnaire design and identifies the rationale of each question used in the study questionnaire. Likewise, the outline of how the study research question would be used in a statistical analysis is covered.

CHAPTER FOUR - Experimental Design

How these research questions would be examined and what questions were asked to students in the study is described in the following sections.

4.2 Questionnaire Design

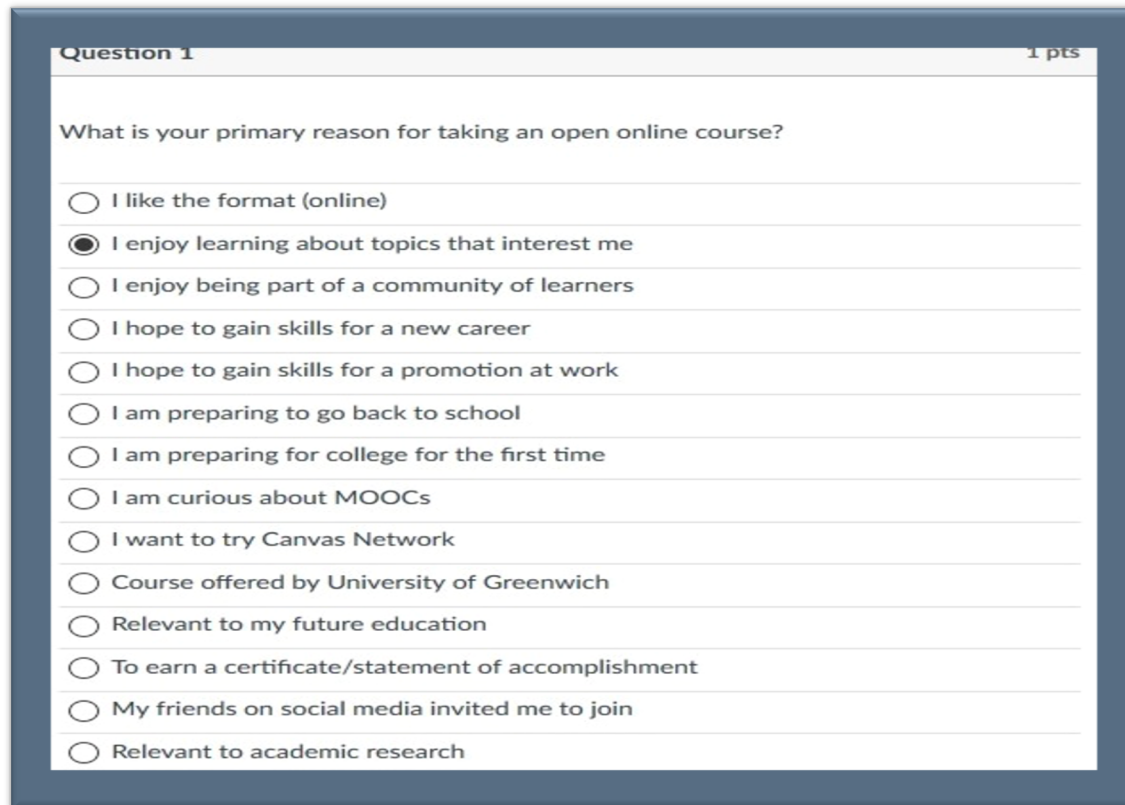
4.2.1 Welcome Survey

The first questionnaire students are expected to complete on the course platform is the welcome survey. The Canvas network, the MOOC platform provider, has a standard welcome survey also. Some of the questions in the Canvas questionnaire are the same as for the study survey. For example, the demographic information, and reasons for joining the MOOC (slightly modified). As a result, it was decided to merge the two questionnaires. The questions from the welcome questionnaire listed below are the ones relevant to answering the research question.

4.2.2 Information on Intentions

The first part of the welcome survey questionnaire comprises gathering participants' personal information. This segment of the questionnaire was planned to obtain data from learners about their; (a) aims for signing up for the course (b) planned number of hours to dedicate to the course (c) their motivation in taking the course and their general usage of social media. The welcome survey is specifically designed to capture information on motivation (intentions) for taking the course, their previous experiences of online learning and social media engagement.

CHAPTER FOUR - Experimental Design



Question 1 1 pts

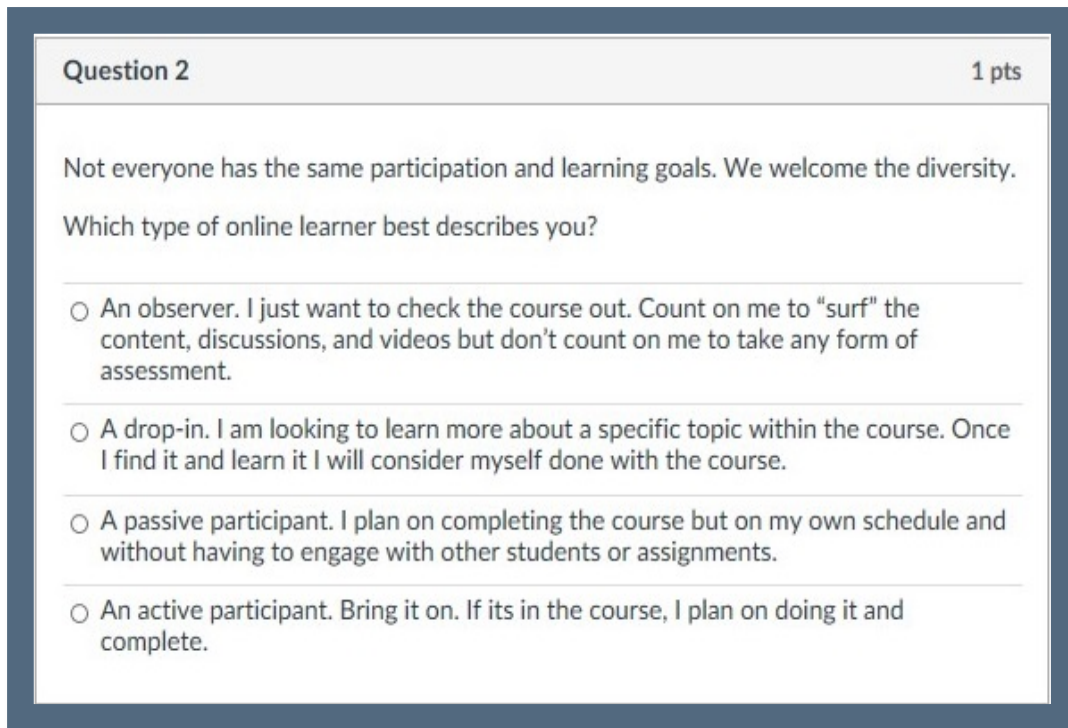
What is your primary reason for taking an open online course?

- ☐ I like the format (online)
- ☒ I enjoy learning about topics that interest me
- ☐ I enjoy being part of a community of learners
- ☐ I hope to gain skills for a new career
- ☐ I hope to gain skills for a promotion at work
- ☐ I am preparing to go back to school
- ☐ I am preparing for college for the first time
- ☐ I am curious about MOOCs
- ☐ I want to try Canvas Network
- ☐ Course offered by University of Greenwich
- ☐ Relevant to my future education
- ☐ To earn a certificate/statement of accomplishment
- ☐ My friends on social media invited me to join
- ☐ Relevant to academic research

Figure 4.1: Collecting data on motivation

In fig 4.1 above, the question seeks to find out the motivation for the individual taking the course. This relates to the objective (*To find out how motivated students are engaging in the course social media interactions during the course*). Onah et al., (2014) based on the subject they find interesting, most of the learners sign up for MOOC centred on topics they find motivating and are conversant with. At the start, most MOOC learners have a clear interest and expectations. Therefore, in this study, the question on learners' motivation in taking the course is necessary because it offers an understanding of the aims for signing up for the MOOC, which is essential in giving a more in-depth insight on other factors that can affect students' motivation apart from their engagement on social media. The OLEI scale (Online Learning Enrolment Intentions) which was developed by Kizilcec and Schneider, (2014) and used in survey of course that was optional in 14 MOOCs offered by Stanford University, was slightly modified to include (*"course offered by university of Greenwich", "I want to try canvas network and my friends on social media invited me"*).

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Question 2 1 pts

Not everyone has the same participation and learning goals. We welcome the diversity.
Which type of online learner best describes you?

- ☐ An observer. I just want to check the course out. Count on me to "surf" the content, discussions, and videos but don't count on me to take any form of assessment.
- ☐ A drop-in. I am looking to learn more about a specific topic within the course. Once I find it and learn it I will consider myself done with the course.
- ☐ A passive participant. I plan on completing the course but on my own schedule and without having to engage with other students or assignments.
- ☐ An active participant. Bring it on. If its in the course, I plan on doing it and complete.

Figure 4.2: Collecting Data On Learners' Intention To Engage In The MOOC

In Fig 4.2 above, the question seeks to find out the plan's learners have for the course. This question would provide useful information on students' intents as regarding whether they have the intention to complete the course or not. According to Koller and Ng, (2013) for metrics of retention to be useful, learners goal should be taken into consideration when defining and interpreting retention. Inactive lecture viewers, for instance, might go through a whole course without ever going through an valuation or assessment, yet often get a significant worth from a MOOC without contributing to completion-based viewpoints of retention (Koller and Ng, 2013). Therefore, results from the responses on the above question would help in discussing MOOC retention rates, with the bigger picture in mind of knowing students' intentions.

4.2.3 Motivation Questionnaires

One of the most vital section is the questionnaire segment of the study survey as it aims to collect data about learners' motivation and experiences on social media. Lots of questionnaires have been used to measure motivation in MOOCs like the SIMS (Situational Intrinsic Motivation) questionnaires developed by Guay, Vallerand and Blanchard (2000); Motivated Strategies for Learning Questionnaire (Pintrich et al., 1993).

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Keller and Kopp (1987) used the Instructional Materials Motivation Survey (IMMS) of Students' motivation in terms of relevance, attention, confidence and satisfaction. Besides, Chanlin (2009) is a web-based course used motivational analysis and report that Keller's attention, relevance, confidence, and satisfaction (ARCS) model was a useful model for investigative learners' motivational difficulties. After detailed evaluations of these questionnaires, the SIM was slightly modified, and a professional in the social sciences was consulted to advice on the modification. It was recommended that modifying the questionnaire would not be appropriate. Therefore, to obtain data on motivation, the questionnaire was designed to ask the participants "*How motivated are you engaging in this Social Media group*". In addition, to obtain data on the impact of early engagement on the course registration, the statement was "*My early engagement with SM motivated me to register for the course*" with the options which consisted of a 5-option Likert scale (there are 5 choices of strongly agree, agree, strongly disagree, disagree and don't know).

As shown in Figure 4.3, the first question on the motivational questionnaire is the email address. The participants are to provide the email address they would use in registering in Canvas. The reason for this was to explain to the students, which is to match their responses with their canvas course activities. In the course forum, each student is identified by their login details (emails and names).

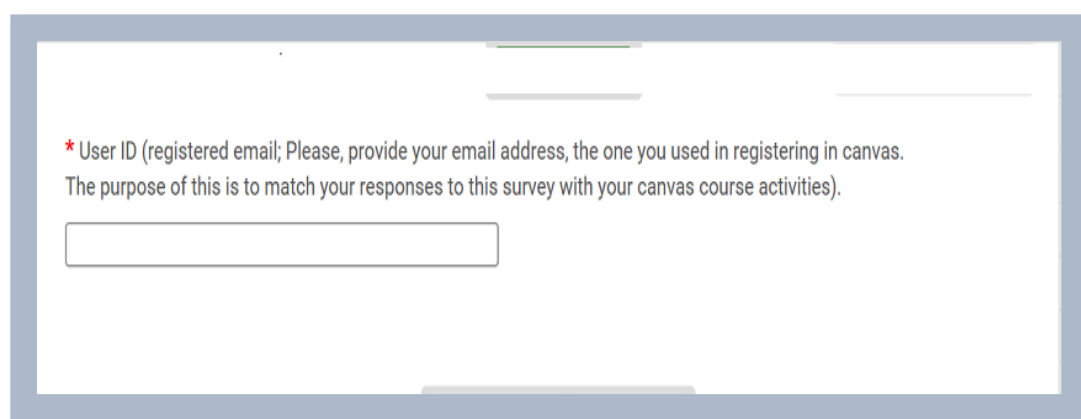
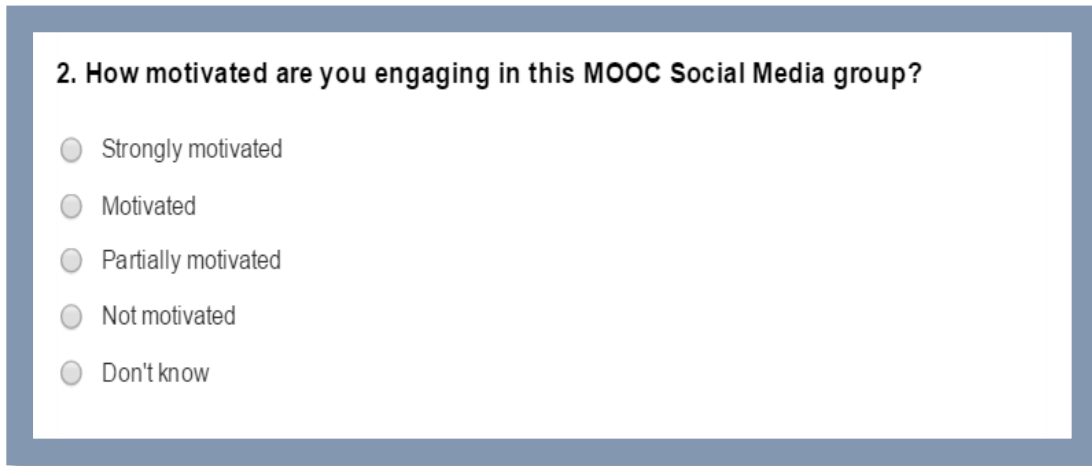
The image shows a screenshot of a survey form. At the top, there is a header bar with a logo on the left and some text on the right. Below the header, there is a section titled "User ID (registered email; Please, provide your email address, the one you used in registering in canvas. The purpose of this is to match your responses to this survey with your canvas course activities)." in red text. Below this text is a text input field. The entire form is enclosed in a light blue border.

Figure 4.3 Collecting data on learners' registration

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2. How motivated are you engaging in this MOOC Social Media group?

- ☐ Strongly motivated
- ☐ Motivated
- ☐ Partially motivated
- ☐ Not motivated
- ☐ Don't know

Figure 4.4 Collecting data on learners' engagement social media

This question is related to the objectives (*To find out how motivated students are engaging in the course social media interactions during the course*). The rationale behind the question has been explained in section 4.2 in this chapter.



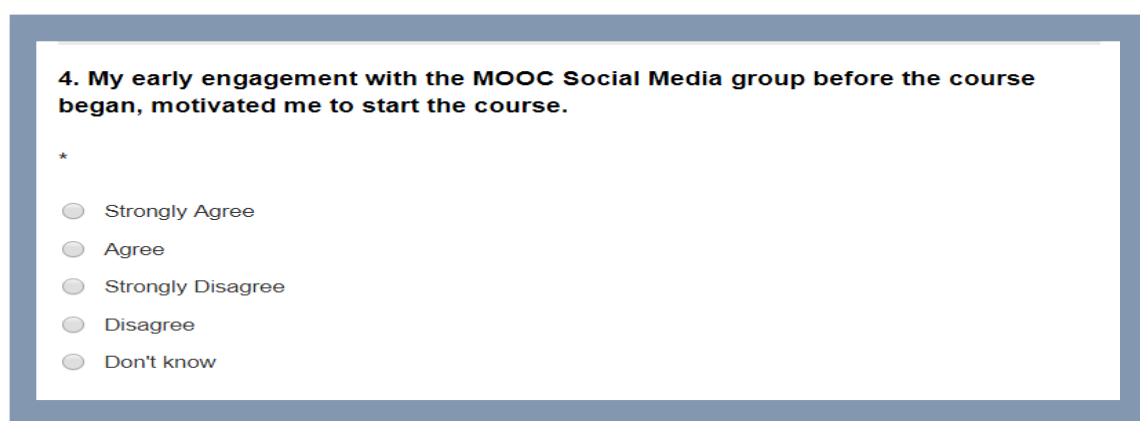
3. When did you start engaging in the Social Media interactions?

- ☐ Before the course started
- ☐ After the course started

Figure 4.5 Collecting data on learners' social media interaction period

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In Figure 4.5, the questions ask students when they started engaging in social media interactions. The intention was to get information on the period the learners began engaging in social media so that learners who started before the course would be differentiated from those who started during the course. This data will help answer the research objective, *“To find out how motivated students are to engage in the course social media interactions during the course”*



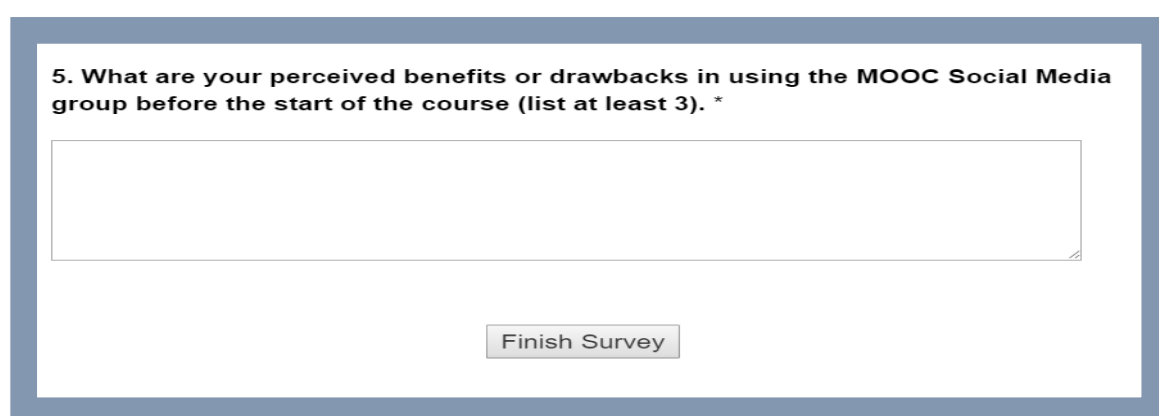
4. My early engagement with the MOOC Social Media group before the course began, motivated me to start the course.

*

- ☐ Strongly Agree
- ☐ Agree
- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Don't know

Figure 4.6 Collecting data on learners' motivation to start the course as a result of early engagement on social media.

The justification behind question in Fig 4.6 is to obtain information to meet the research objective *“To find out if early engagement in social media increase the number of students who starts the MOOC from those who have registered.”* The question has options which consisted of a Likert scale running from strongly agree to strongly disagree and don't know.



5. What are your perceived benefits or drawbacks in using the MOOC Social Media group before the start of the course (list at least 3). *

Figure 4.7 Collecting data on learners on experiences of social media

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Having asked their motivation to engage in social media, learners were requested to share their perceived benefits and drawbacks in the course. This question was designed to provide data for the objective (To find out the benefits and drawbacks of the MOOC learners engaging on social media forums). The intention was to collect qualitative data to get a deeper insight of learners' motivation. According to Dudovskiy (2015), qualitative data can be divided into five categories:

- a. Content analyses
- b. Narrative analysais
- c. Discourse analysis
- d. Framework
- e. Grounded theory.

After careful analysis of the different approaches, the thematic analysis will be used to analyse the responses because according to Braun and Clarke (2006), it would capture the significant features of the data concerning the research question that would represent quite some level of pattern reactions or significance within the data set. In addition, according to Vaismoradi, Turumen and Bonda, (2013), this approach is beneficial because it defines the classification of analytical stages, offers the researchers with friendly and precise methods to analyse the data. In conclusion, Vaismoradi, Turumen and Bonda, (2013) state that thematic analysis methods are strong enough to be used for carrying an initial study on a new phenomenon.

4.2.4 Exit Questionnaire

The Exit questionnaire is aimed to collect data on learners' status of completion and experiences on the course.



Question 1	1 pts
How much of the course did you complete?	
<input type="radio"/> Most of it	
<input type="radio"/> About three quarters of it	
<input type="radio"/> About half	
<input type="radio"/> Less than a quarter	

Figure 4.8 Collecting data on course completion

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The data from fig 4.8 gives information on how much of the course the students completed. The data would be used for discussion of the results on retention.

Question 2 1 pts

If you did not complete everything you wanted to do in the course, please indicate the reasons for non-completion (Please tick all that apply).

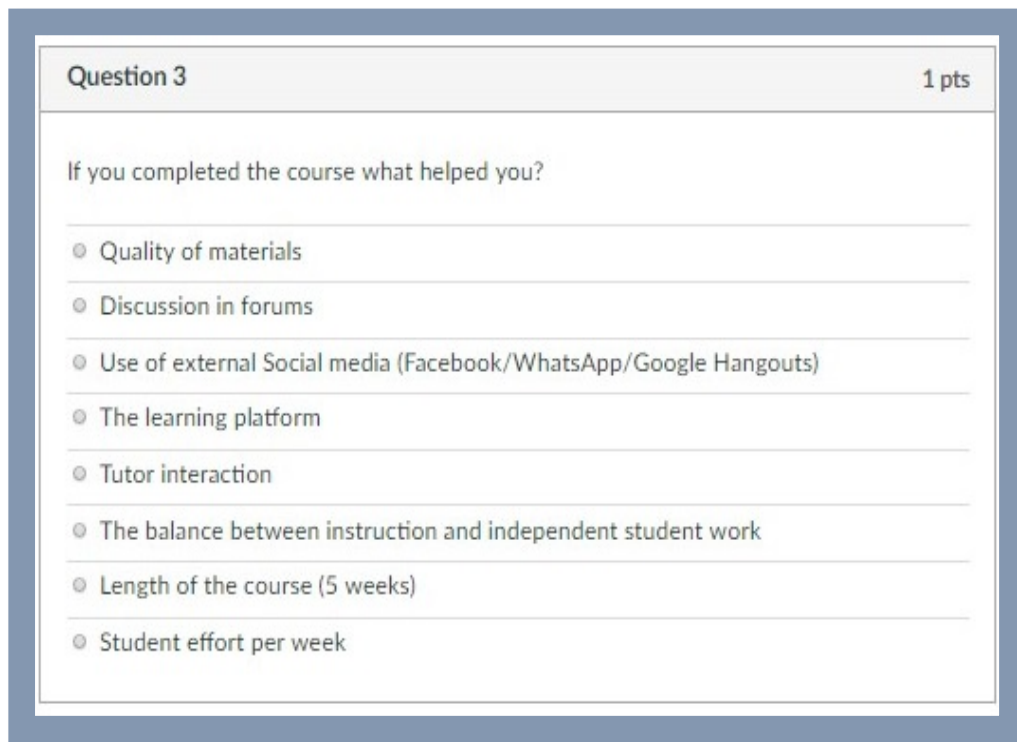
- ☐ I didn't intend to complete
- ☐ I already knew some of the course topics
- ☐ I didn't understand the course material
- ☐ I didn't understand the assessment tasks
- ☐ I found difficulty in using the learning platform
- ☐ It wasn't what I expected
- ☐ I found the time required too demanding
- ☐ I left for personal reasons
- ☐ I didn't feel able to engage with my fellow students on the course forums

Figure 4.9 Collecting data on non-completion

The rationale for asking this question in the exit questionnaire is to obtain information on the reasons for non-completion. According to Kizilcec and Schneider, (2015), diverse motivational goals (e.g. career change, relevant to the job, meeting new friends), may forecast distinct pattern of behavioural for MOOC learners. The participants have opportunities to mention other factors in question 4, where they could add additional comments. The results from these data will be used to meet the objective related to retention.

This question aims to obtain information for the explanations for non-completion of the course. According to Reich (2014) the completion rate should be observed at ground of student's intents, arguing that most times measuring MOOC certification rates is ambiguous because it does not take into consideration student's intention because students' reasons for MOOC sign up are many. Furthermore, Reich stress those other students who sign up for MOOC have the intention to audit the course only or complete the course partly. Therefore, the answers provided to the question in fig 4.9 will be matched with their completion data from the canvas analytics. The data obtained will be analysed to understand their intentions and any other factors that have influenced a student's non-completion.

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Question 3 1 pts

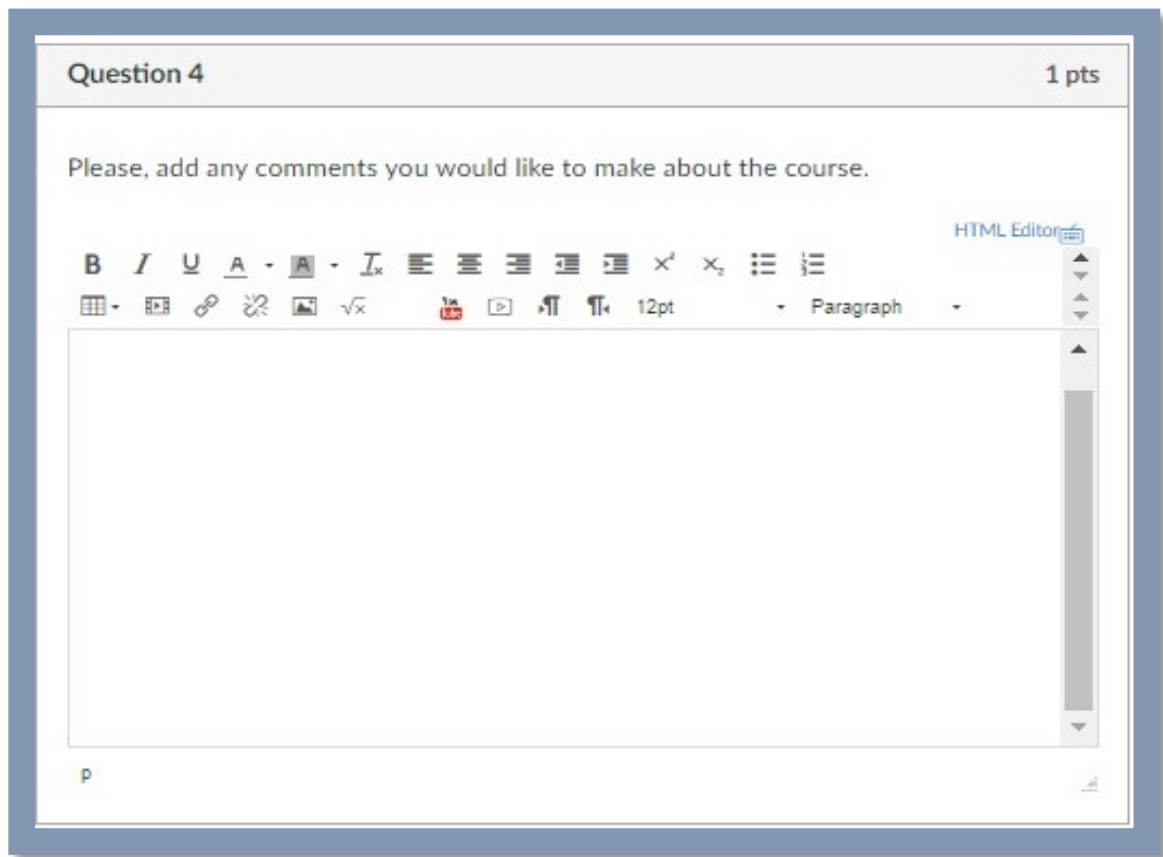
If you completed the course what helped you?

- ☐ Quality of materials
- ☐ Discussion in forums
- ☐ Use of external Social media (Facebook/WhatsApp/Google Hangouts)
- ☐ The learning platform
- ☐ Tutor interaction
- ☐ The balance between instruction and independent student work
- ☐ Length of the course (5 weeks)
- ☐ Student effort per week

Figure 4.10 Collecting additional data on completion

The rationale behind this question is to obtain information from the course completers on any other factors that might have positively influenced their course completion apart from their motivation to engage in social media.

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The screenshot shows a Canvas LMS question interface. At the top, it says 'Question 4' on the left and '1 pts' on the right. Below this is a text prompt: 'Please, add any comments you would like to make about the course.' Underneath the prompt is a rich text editor toolbar with various icons for bold, italic, underline, text color, background color, bulleted list, numbered list, indent, outdent, link, unlink, image, and video. To the right of the toolbar is a vertical scrollbar. Below the toolbar is a large, empty text input area. At the bottom left of the input area is a small 'p' icon, and at the bottom right is a small 'HTML Editor' icon.

Figure 4.11 Collecting additional data on learners' experiences on the course

The rationale behind this question is to obtain qualitative data from learners through other comments that have not been covered in the questionnaire and allow them to express their views about the course, which will be useful in discussing students' motivation.

4.3 Canvas Analytics

4.3.1 MOOC Engagement Metrics

In many studies in MOOCs, the engagement rate is calculated by analysing indicators of engagement such as the use of quiz completion, discussion forums, assignments and videos watched (Salmon et al., 2015; Xie et al., 2011; Xiong et al., 2015). In this study the engagement which will be used to calculate objective four will be calculated using the assignment submitted (business plan), a total number of quizzes attempted (questionnaires), the total amount of participation, no of page views and whole full time spent on course activities (activity volume).

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/According to Qi (2016), Canvas analytics defines students' engagement as the "*Course Access Report*" which is located in the *People* section of the course dashboard. The course access reports show summaries of students' participation in the course (assignments, quizzes, discussions, the number of times the user viewed the content, total percentage of the involvement in the course, and overall activity (time spent) (Qi, 2016). Therefore, the Canvas engagement metrics are useful in this context because all the variables, as described above, would be used in calculating course engagement. The data on participation was downloaded from the Canvas "*View Course Analytics Section*" of the platform. The data from the Canvas analytics will be downloaded in spreadsheet file format. Data on the daily amount of participation of all the learners will be calculated for the 57 days of the course. Each learner will be marked according to the two groups (Social Media & No Social Media). The "sort" tool in excel will be used to separate the two groups. The total amount of "Participation" (number of threads, i.e. posts and replies in course forum) per day for all the 57 days will be obtained for each group and input into SPSS for analysis. The same procedure will be used to obtain the remaining engagement variable "Page view" (number of pages clicked or viewed) and "Activity volume" (total time spent on course forum).

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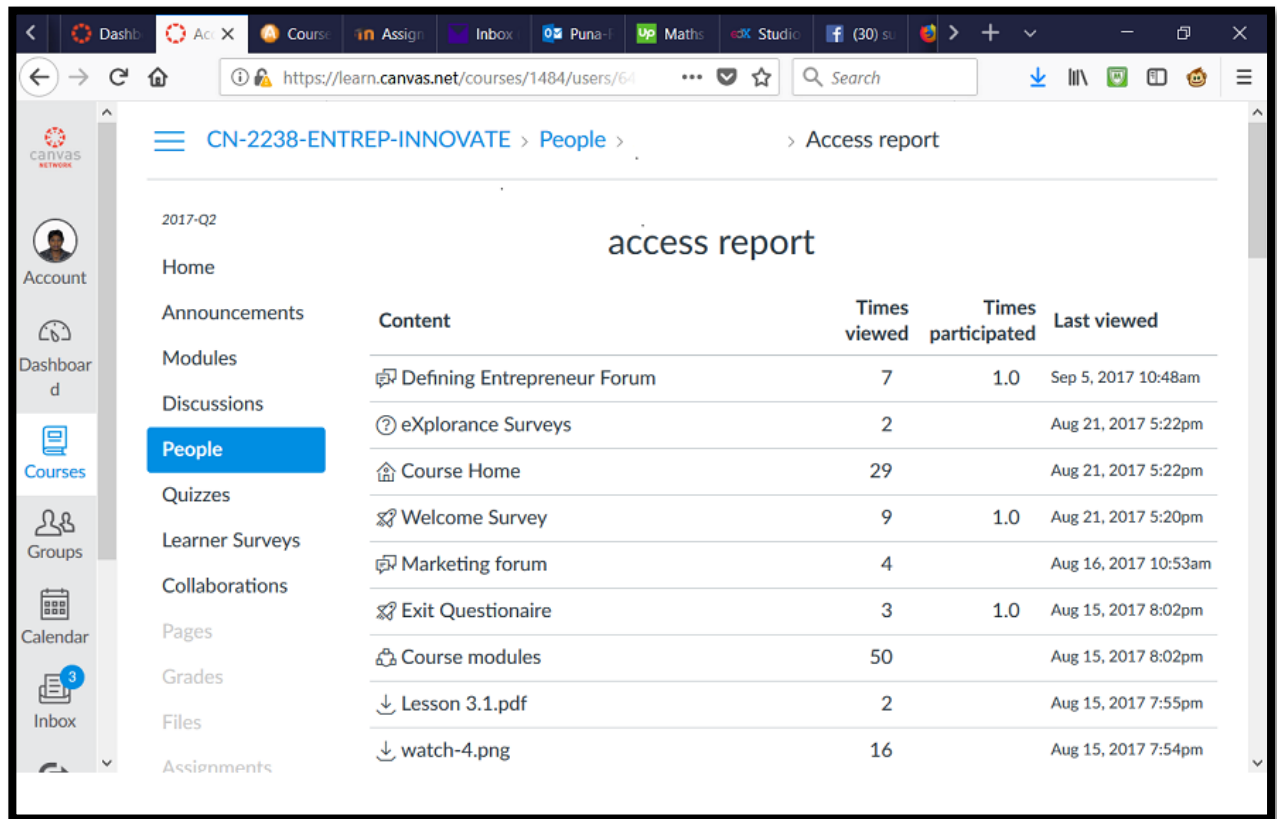


Figure 4.12 Sample of a screenshot of learner access report

Data on participation, times viewed, and the last time students viewed the course will be collected from the course dashboard.

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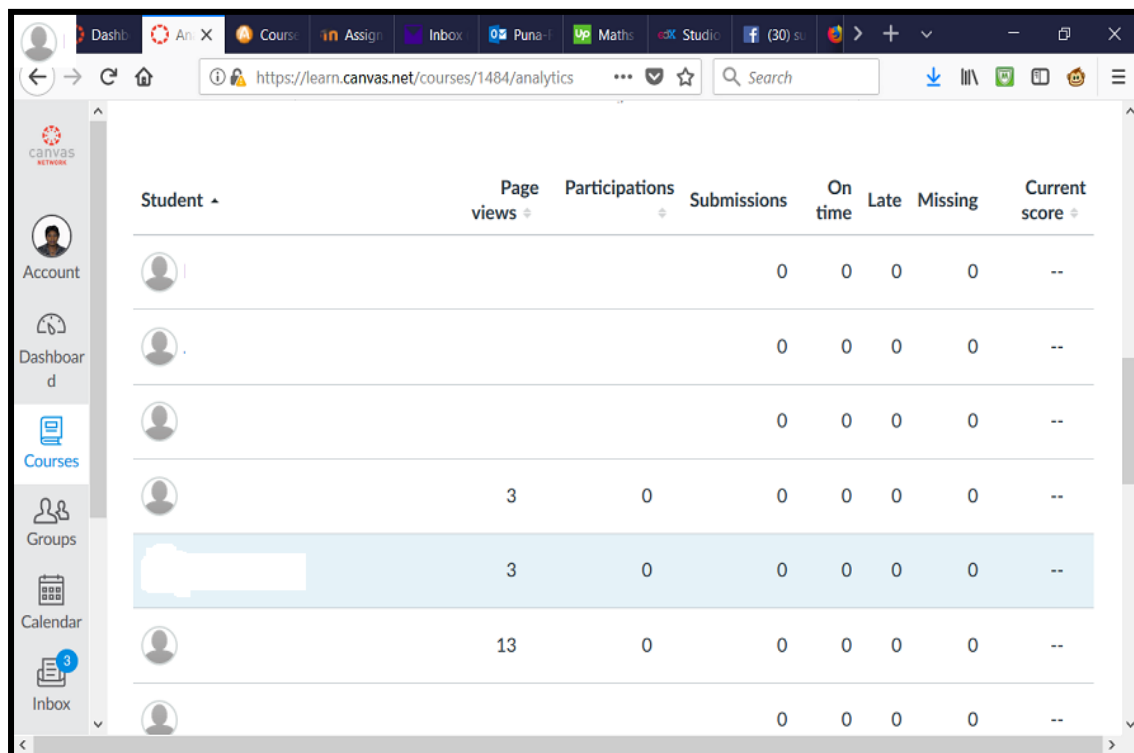


Figure 4.13 Screenshot of Canvas dashboard

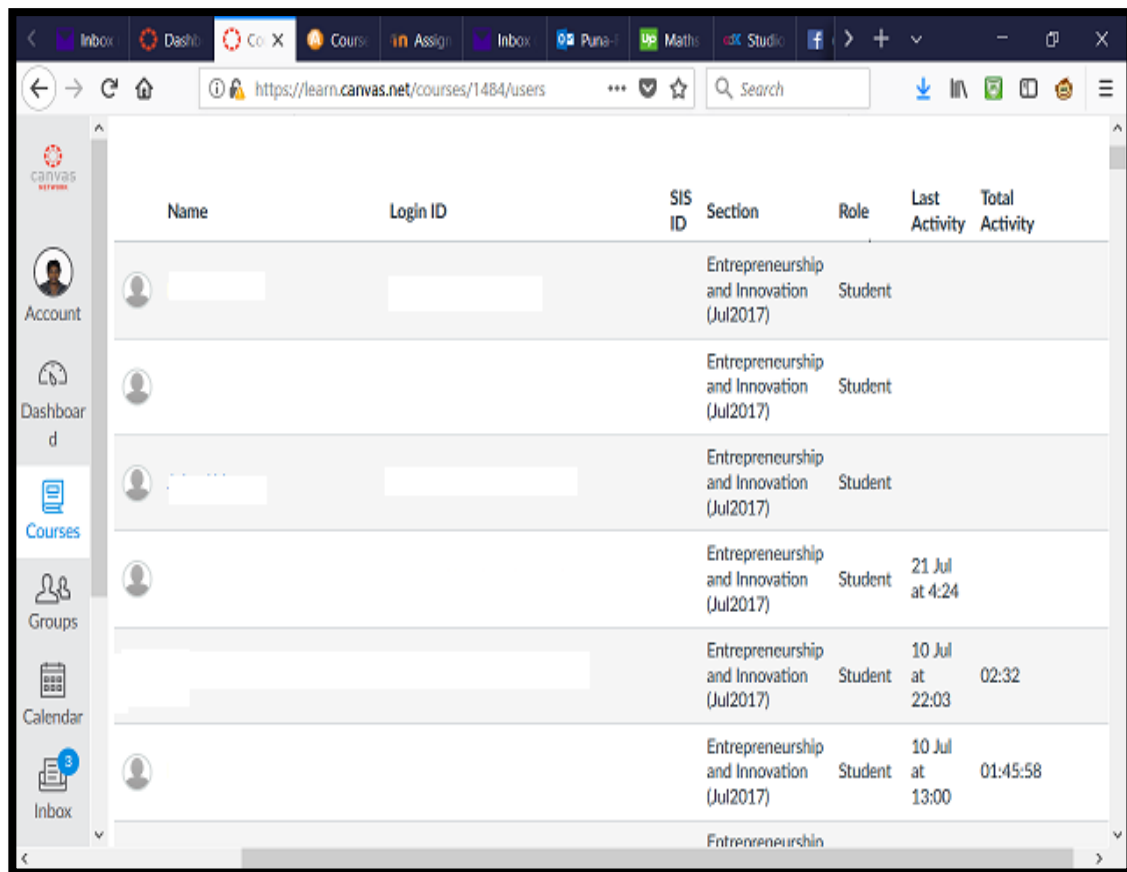
Data on page views, participation, and times viewed, and assignment submission will be collected from the dashboard to answer objective 3.

4.3.2 Measuring Retention and Completion

Apart from the MOOCs' engagement measure, the retention is an important metric that will be as measured in this study. The retention rate will be measured in the "number of participating days". This will be measured by "First Access" that is the first time the students viewed or participated in the course. "Last Access" measures the last activities of the students, the last time the students viewed any content in the course. Therefore, retention is assessed by the number of days between, the first day of activity in the course and the last day of action by the students. This retention model was chosen because first, the Canvas analytics provides the first and the last day of students' activities and secondly the number of days students spent on course has been used on face-to-face courses as retention. Xiong et al, (2014) also use this method of measuring retention in MOOCs.

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Completion rate is an important metric that will be measured in this study. Many researchers have proposed several ways of measuring completion rates as discussed in detail in including the pros and cons in chapter 2, section 2.11. For this study, the completion rate will be measured by (submission of the business model plan and filling all the three questionnaires (welcome, motivation for those in social media forum and exit questionnaire). This will be stated clearly to learners that to obtain a certificate of accomplishment, they would need to fulfil these requirements. This requirement was chosen because submitting a business plan demonstrates the ability of the learners to apply what they have learnt in the course to develop their business plan and get a peer review from other learners. Other factors that affect completion, such as learners' intentions and reasons for non-completion, will be obtained from the questionnaires.



The screenshot shows the Canvas dashboard interface. The left sidebar contains navigation links for Account, Dashboard, Courses, Groups, Calendar, and Inbox. The main content area displays a table of users and their activity. The table has columns for Name, Login ID, SIS ID, Section, Role, Last Activity, and Total Activity. The data is filtered for the course 'Entrepreneurship and Innovation (Jul2017)'.

Name	Login ID	SIS ID	Section	Role	Last Activity	Total Activity
[Redacted]	[Redacted]		Entrepreneurship and Innovation (Jul2017)	Student		
[Redacted]	[Redacted]		Entrepreneurship and Innovation (Jul2017)	Student		
[Redacted]	[Redacted]		Entrepreneurship and Innovation (Jul2017)	Student		
[Redacted]	[Redacted]		Entrepreneurship and Innovation (Jul2017)	Student	21 Jul at 4:24	
[Redacted]	[Redacted]		Entrepreneurship and Innovation (Jul2017)	Student	10 Jul at 22:03	02:32
[Redacted]	[Redacted]		Entrepreneurship and Innovation (Jul2017)	Student	10 Jul at 13:00	01:45:58
[Redacted]	[Redacted]		Entrepreneurship and Innovation (Jul2017)	Student		

Figure 4.14a Screenshot of Canvas dashboard showing activity volume

Data on activity volume (total time spent on course) will be collected from the dashboard, as shown in figure 4.14a.

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The data will be obtained to calculate the mean differences in activity volume between those engaged in social media and the non-social media group (answer objective 3). The data will be obtained using the same procedure as described for course engagement in 4.6.1.

4.4 Steps to Data Analysis

The steps to analysing the data are summarised in the table below.

Objectives	Data	Process	Expect Results (Statistical Analysis)
1. To find out if early engagement on social media increases the number of students who starts the MOOC from those who have registered.	To meet objective 1 Extract data (numbers) from the Motivation Questionnaire (question 4)	Import data to Excel and examine the statistical distribution of the responses to Question 4	Descriptive statistics represented in the form of a histogram showing responses of strongly agree to disagree. The total number of Strongly agree and Agree will be combined to get the total responses on those who engaged in SM and started and the qualitative results. This would be used to answer objective 1
2. To find out how motivated students are engaging in the course social media interactions during the course.	To meet objective 2 Extract data(numbers) from Motivation Questionnaire (2) Extract qualitative data (text) from Motivation Questionnaire	Import data to Excel and look at the statistical distribution of the responses to objective 2 Use thematic analysis to categorise it into themes. This method will be used because it captures the	Descriptive statistics represented in the form of a histogram showing responses of strongly agree to disagree. The total number of Strongly agree to Agree will be used to answer objective 2 Discuss the themes that fall within motivation.

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		essential aspects of the data concerning the research objective	
3. To find out the relationship between motivational factors (intentions) of social media participants' and completion.	<p>Extract data (number) on learners from social media forums</p> <p>Use their login details to trace their responses to the Welcome Survey on their:</p> <ol style="list-style-type: none"> 1. Responses regarding intentions (See fig 4.2). 2. Data on Completion 	<p>Import data (numbers) to SPSS and run a Spearman correlation coefficient test between intentions and completion.</p> <p>Spearman correlation coefficient is chosen because it is a method, which can be used to measure the strength and direction (negative or positive) of a relationship between two variables. The result is always between 1 and minus 1</p>	Correlation Coefficient tables showing P-value and scatterplots

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<p>4. To find out if there are significant differences in course engagement between MOOC students who engaged in social media and those who did not.</p>	<p>1. Data (numbers) on course engagement will be extracted from Canvas dashboard and downloaded into an Excel spreadsheet.</p>	<p>1. Import data (numbers) from a spreadsheet into SPSS and run a normality test, which is a criterion to run independent T-test. This test is appropriate because the independent-samples t-test (or t-test, for short) compares the means between two unrelated groups on a similar continuous, dependent variable (Laerd, 2017).</p> <p>2. Data will be checked for <i>five assumptions</i> to fulfil the Independent T-test.</p> <p>3. If data is normal, the Independent T-</p>	<p>The expected result is a table showing:</p> <p>1. Test of normality 2. Descriptive statistics 3. Histogram 4. Q-Q plots 5. Scattered plots 6. Mann-Whitney Test table showing P-value. Sig. (2-tailed/1tailed)</p> <p>If $p < .05$, this means that the mean differences between the two groups are statistically significant and if vice versa $p > 0.5$ then the differences are not statistically significant.</p>
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		<p>test will be conducted to compare the means of the course engagement variables of SM group and Non SM group.</p> <p>4. If data is not normal, MANN-WHITNEY U TEST will be used. The Mann-Whitney U test is a rank-based nonparametric test that can be used to determine if there are differences in the means between the two groups</p>	
5. To find out if there are differences in retention between MOOC students who engaged in the course social media and those who did not.	Test for normality using the same process in objective 4 MANN-WHITNEY U test will be carried out in	<p>Carry out normality check as described in above objective 4</p> <p>Steps of T-test as described in objective 4 above</p>	Expected results, as described in objective 4.

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	the same procedure as objective 4 <i>Independent T-test</i> will be conducted to compare the means of the course engagement		
6. To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC.	Extract qualitative data (text format) from Motivation questionnaire and focus group study	Conduct a thematic analysis. This method is chosen because it captures the essential aspects of the data concerning the research objective. Extend this method to focus group study.	Categorise finding into themes to identify the patterns of meaning across the data.

Table 1: Statistical steps to analyse data

4.5 MOOC Design Process

4.5.1 Introduction-1st MOOC

During the investigation of the literature, the department happened to be running a MOOC entitled “*Entrepreneurship and Innovation*” as a result of funding awarded from an EU/Lifelong Learning Programme in 2015. The supervisors of this PhD were involved in the research and it was offered through the Canvas VLE in May 2015.

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4.5.2 1st MOOC Design

The MOOC was designed to be student-centric, and the expectation was that students would independently go over the course materials and form groups on the course forum (Bacon, et al 2015) in order to undertake a joint entrepreneurial activity. Furthermore, Bacon, et al (2015) report that the purpose was to select an innovative idea and turn it into a business plan for establishing a start-up company. To further this goal, the students were trained to use a methodology called Concurrent Design (CCD) process together with specific tools for personal and business development (in the early stages of the course), namely Osterwalder Canvas Model YOU and Osterwalder Model Generation (Bacon, et al 2015).

During the course delivery, according to Bacon, et al (2015) self-directed learning grounded on well-structured, well-prepared, courseware material was emphasised as well as the effective combination of networked learning and collaborative work in small groups (approx. 4-8 members/group). Furthermore, it report that after setting up the group, in which students developed a Personal Learning Network (PLN), the learners are to discuss and choose a novel idea (during the first stage of course delivery), which would act as the basis for their entrepreneurship learning development and the appropriate Business Model and Business plan development (Bacon et al., 2015).

The 1st MOOC consisted of 5 modules: introduction, CCD - Concurrent Design: a process methodology and tools for online collaboration, which was used for the application of a business model. Osterwalder Business Model Canvas: Tools for individual improvement and designing a business model. Entrepreneurship: which comprises of material on different features of entrepreneurship and development, business modelling and group work presentation on the business model (Bacon et al., 2015).

The expected minimum hours for the course was at least 50 hours, which is about 6 hours of effort per week of learning undertaken for over eight weeks (Bacon, et al 2015). According to Colman (2013), Kloft et al., (2014), the duration of a MOOC can affect the dropout rate. However, Bacon et al., (2015) explain that two reasons necessitated these requirements first because it was felt that 50 hours of work was vital to study the topic and students can have enough time to practice and apply the ideas taught.

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4.5.3 Results of 1st MOOC.

The 1st MOOC ran between May and July 2015. Bacon et al (2015) report that 1581 sign up to take the MOOC. Out of that, 804 sign up but never started the course (51.7%) which according to Onah et al. (2014), Jordan (2015) is typical of most MOOCs. Also, Bacon et al., (2015) report that 752 started an activity at least once, 572 stopped engaging in the MOOC after three weeks, 28 disengage from the course.

During the MOOC course, Bacon, et al., (2015) also report that the first week drop off was significant with 684 students viewing the home page and only 196 of those making it to the overview for module 1. This results as further emphasised by Bacon et al. (2015) supports the research that the first one to two weeks is a critical time in which to engage and motivate students with the course materials to impact retention. Thus, these results prompted the decision to redesign the MOOC and engage students before the course starts to build the momentum and motivation that would help more students to not only start the course but also to retain the students for a longer period (Ripiye et al., 2017).

Bacon et al., (2015) also note that it was essential to consider how success is judged based on students' intentions to complete the course given that 49% never intended to complete the course. Additionally, according to Bacon et al., (2015) these statistics is from the learners who were sufficiently engaged actually to start the MOOC, 829 didn't get that far. According to Ng, et al., (2013) for retention metrics to be beneficial, it must be well-defined and understood in line with the learner's goals in mind.

In addition, Bacon et al., (2015) report that besides, only 12% (of those who filled the survey) explicitly wanted to engage with their peers. It was also noted that some of this restraint be influenced by other factors such as language skills because learners were from all over the world, and 57% did not have English as their first language. At the end of the MOOC, the report by Bacon et al., (2015) show that the MOOC completion was less than 10%.

Research based on the completion rate and the review of literature on the low MOOC completion rate, it was decided to do a rerun of the MOOC course using social media engagement to promote interaction and retention.

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Some of the differences between the 1st and the 2nd MOOC are outlined as shown below and a comparison table between the 1st and 2nd MOOC in chapter 6, section 6.3.1.

4.5.4 2nd MOOC

Based on the poor retention in the 1st MOOC, the 2nd Entrepreneurship and Innovation MOOC was redesign with similar content to the first MOOC except that the second delivery will be supported by a connectivist approach, which has been defined as the learning theory of the digital age, and position the students at the centre of learning (Kop and Hill, 2008; Simens, 2005; Dunaway, 2011; Tschofen and Mackness, 2012; Ravenscroft, 2011). The key differences between the first and second MOOC, and the reasons it was felt the two experiments were not directly comparable, were as follows:

1. It was thought that the CCD (Concurrent Design) was too complex and time-consuming to teach, which also then required group work apply, in a short MOOC. Getting students to work in groups in MOOC is very challenging when they need to solve a problem jointly as opposed to discuss/debate an issue. This is especially problematic when students are engaging erratically. This content was dropped which then allowed the length of the MOOC course to be reduced from 8 weeks to 5 weeks, which is closer to more MOOCs that are traditional.
2. Through the use of the CCD design process, students had been asked to submit their entrepreneurship design and documentation as a group; however, everyone submitted an individual set of documentation for their idea. Therefore, given the CCD process was dropped, the second MOOC focused only on asking students for individual submission.

The 2nd MOOC is expected to run for five continuous weeks with a range of assignments, quizzes, peer review activities and informative videos. As stated in the methodology section, students were given the option to register on social media; all students will go through the five modules, engage in course activities (reflect, collaborate, watch videos) and join in Canvas discussion forums. Students were expected to participate in forum discussions accompanying weekly course releases in Canvas. The new model is going to be re-designed to give students the opportunity to network. This includes inspiring students to become a dynamic member of a social network, Facebook, either Google Hangouts or WhatsApp.

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Furthermore, Chetty (2013) also emphasise utilising the MOOC design, which entails the teacher building a learner-centric environment of learning before directing the learners through the learning experiences. In this MOOC, the instructor will design the course materials, but during the course execution, the role of the instructor will be to provide an introduction each week, comments on student's business models and answer questions.

Bartolleti, (2016) describe the following practices as useful for improving and reflecting on course design for Massive Open Online Courses:

- (1) Employing a team-based method to design MOOC.
- (2) Collecting, researching, and gathering ideas and resources to support topics.
- (3) Curating and eliminating concepts and resources over a group development of considering thoughtful and conversation.
- (4) Exploring fresh, older, and occasionally using improved tech tools to produce influential learning experiences.
- (5) Connecting, reflecting, and retrieving tools, ideas and resources through open discussion about what is most significant.

In the E&I MOOC design, the team had several meetings. The process included a reflective review of the materials used in the first MOOC in 2015, deliberation, collection of resources from the internet (videos, links) and collaborative meetings.

Further to this, Bartoletti (2006), Puzziferro and Shelton, (2008) recommend that connectivism MOOC design should involve the following team: subject matter expert, social media facilitator, learning designer, multimedia developer and graphic designer. In the E&I MOOC design team consisted of: –

Subject matter experts: Producing and adjusting course content.

Multimedia developer: Videoing, videos editing, and uploading content to the course site.

Graphic designer: Editing images.

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Educationalist: pedagogical design.

Social Media Administrator (Researcher): Set up social media platforms.

The introduction to the course providing an explanation of the course, comprising:

- (1) The course periods
- (2) The anticipated hours of work in a week (e.g. 5–7 hours/week)
- (3) The course syllabus (e.g. The detailed topic for a specific week)
- (4) The course plan that encompassed data about the conduct of the course, the type of prospect and assessments to engage in social media.

The role played by the teacher in a cMOOC be similar to that of an instructor (Rodriguez, 2012). Students who complete each MOOC will obtain a certificate signed by the professor (supervisor) who designed the course. All Certificates of Accomplishment will be offered free. To complete the course, learners will be required to complete the three questionnaires (welcome survey, motivation and exit questionnaire) and the final assessment, which will need them to advance their business strategy for their business and upload it for peer assessment.

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The screenshot shows a web browser window with multiple tabs. The active tab is 'Lesson 1.1: Introduction to Entrepreneurship'. The address bar shows the URL: https://learn.canvas.net/courses/1484/pages/lesson-1-dot-1-introduction-to-entrepreneurship?module_item_id=172630. The Canvas interface includes a left sidebar with navigation links: Account, Dashboard, Courses, Calendar, Inbox, Commons, Help, and Course Catalog. The main content area displays the course title 'CN-2238-ENTREP-INNOVATE > Pages > Lesson 1.1: Introduction to Entrepreneurship'. Below this, there is a 'View all pages' button and a 'Published' status indicator. The lesson title 'Lesson 1.1: Introduction to Entrepreneurship' is prominently displayed. A video player thumbnail is shown with a play button and a link to 'See transcript of video'. The lesson content begins with the text: 'In this lesson we will be exploring definitions of "entrepreneur" and introducing general concepts of entrepreneurship. Upon completion of this lesson, you should be able to:'. This is followed by a bulleted list of learning objectives:

- Define entrepreneurship and discuss its wider impact in the economy;
- Identify and analyse entrepreneurial opportunities;
- Discover and evaluate relevant information about entrepreneurship and the key principles of the entrepreneurial method.

 The text continues: 'Remember, this lesson is just a brief introduction to entrepreneurship. We will be returning to this topic in more depth later in the course. For now, please complete work through the following material. Entrepreneurship requires an understanding of a wide range of topics such as innovation, characteristics of an entrepreneur, finance, how to write a business plan, different types of businesses you can set up, risks, markets etc. However, to get started you need to understand what entrepreneurship means. Dictionary definitions vary from someone who pioneers change to others who work for themselves so let's start by looking at some definitions. There are of course many definitions'.

Figure 4.14b Screenshot of course introduction

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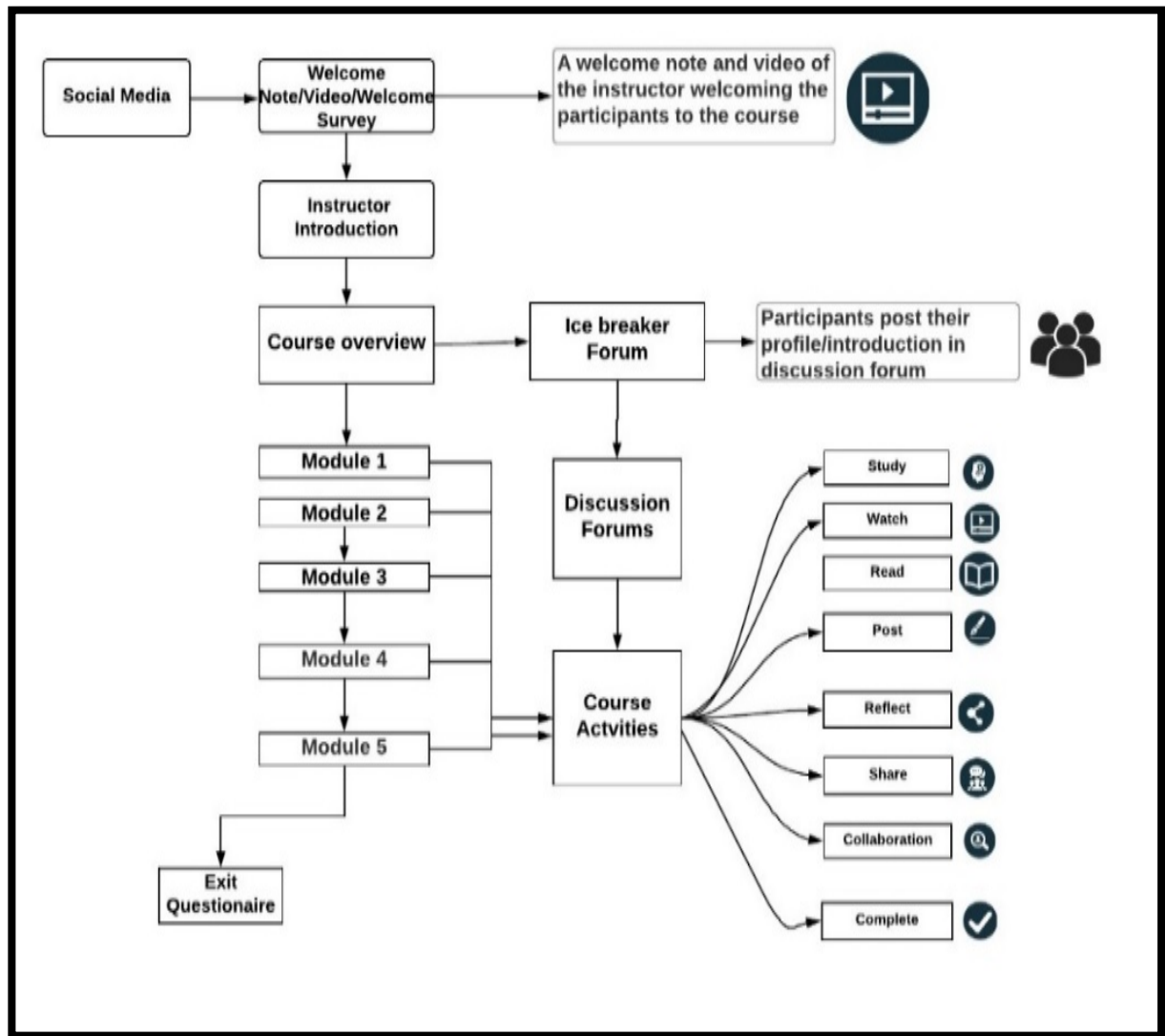


Figure 4.15: E & I MOOC structure and flow

4.6 MOOC Tools Available in the Course

The Canvas MOOC platform consists of diverse kinds of tools, where each category shows the type of interaction the students have with the platform. There are several different types of devices in all. The main tools the students will be using during the course are:-

- **Assessment:** This evaluates the knowledge or student's satisfaction in the MOOC. The assessment tools are online quizzes. There are 3 quizzes (questionnaires) students are required to fill in the course.

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- Assignment: Links to the list of assignments and their explanation, grouped assignment type (e.g. Projects, tasks, participation, etc.). In this MOOC, learners are expected to submit their business model. They will also peer review each other's work.
- Evaluation: Tool, used to download, upload or view tasks given in the MOOC. It also displays the results of the students, together with the assessment for every single job the learners have submitted. Facilitators or instructors can see all the students' grades, while students can only see theirs. In this MOOC, the assignment is not graded.
- File storage: This tool encloses all the files used in the course, such as videos, documents, resources or images. The files are presented as a list with information such as file size and last amendment.
- Discussion Forums: The forums links shows the last threads of the MOOC forum and the learners' threads within it.
- Rich content editor: This is an open media comment tool, which enables learners to record a video introducing themselves and where they came from.
- Peer evaluation: Students use this tool to upload their business plan for peer review.
- Google doc: This is an external tool linked in Canvas. It is available for students to use for sharing and collaborating.

4.7 Social Course Design

In connectivist MOOCs, social media tools are vital because these tools support connectivity, collaboration and communication (deWaard, et al 2011). Couros (2009); Milligan et al., (2013), proclaims that the formation of knowledge is vital to the process of learning (Couros, 2009). Furthermore, social distribution offers a sense of connection that develops learning and supports learners build and reveal significance through dialogue (Kop, 2011). The "E&I MOOC" social media groups have two main objectives:

- (1) Creating an extra environment for MOOC learners to share their experiences.
- (2) Development of social learning and engagement of students' (Mills, 2011).

Course weekly discussion topics and announcements will be the same across the social media platforms and the course forum throughout. The course forum is the main forum for discussion used by all students. All questions about the course will be directed to the main course

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forum. Students will also be encouraged to share whatever they discussed, including resources, on social media, with their colleagues in the course forum. The reason for this is to try to ensure uniformity across the forums. According to Hung (2002), the use of technologies and activities, that foster modelling-mirroring (a process that allows learners to look at each other work and learn from it) will enable learners to build interest, relevance, and motivation to participate in the community, as well as constructs their experience of learning in the course. Students are expected to interact by communicating their thoughts on the weekly course subjects, sharing resources, links and comment on contributions of others related to the course.

4.7.1 Social Media Set-Up and Justification

4.7.1.1 Reasons for Choosing Facebook, Google Hangout and WhatsApp.

The researcher will create three social media platforms before the course advertisement on the Canvas platform, Facebook, Google Hangout, and WhatsApp. The decision to use the three social media platform is based on their popularity Statistica, (2018), affordances, Beer (2012), potential to support learning Alenazi, (2017). Other social media platform that is popular in WhatsApp and as at the moment of this study, scanty literature exists on using WhatsApp in MOOCs (Ripiye, et al. 2016). Therefore, this study wants to look at the potentials and impact of WhatsApp in supporting motivation and learning within a MOOC. Other social media platforms that are also often used in MOOCs are twitter, Tumblr (Wang, et al. 2017; Salmon, et al. 2015). For this study, three social media platforms were chosen because according to Salmon et al., (2015) online designer needs to make sure that learners don't have too many choices of social media to use in online learning to avoid confusion and intimidation. They recommended two or three.

Facebook, according to Statistica (2018), has 2 billion registered members, and it is a Web 2.0 technology, which is a relatively new generation of web-based tools. It enables interaction, sharing, and especially peer-to-peer discussion (Idris and Wang, 2009; Qmul, 2018). Users need to set up a profile of themselves, with professionals and personal information, and then they can post links & multimedia from the internet or their content and photos. In addition, according to Kurtz (2014), though Facebook primarily is not made for educational uses, it can serve as an online environment for discussion, collaboration and knowledge distribution.

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Another reason for the choice of Facebook is the technological, social and pedagogical affordances of Facebook (Idris and Wang, 2009). Furthermore, they report in relations to pedagogical affordances, Facebook supports learning approaches that are innovative, stimulates students' involvement, and enables students' reflections and present multimedia resources. In addition, in the case of social affordances, a different scope of interactions is supported, such as a peer-to-peer group, and a different format of communication such as asynchronous and synchronous (Idris and Wang, 2009). Another reason for using Facebook is that it supports social learning as report by Qmul (2018), where he stated that Facebook helps the students to construct their learning in a social setting.

Also, according to Kurtz, (2014), the use of Facebook Groups is observed as a protected environment, which encourages social learning developments while highlighting learners' participation and vigorous impact, as well as consistent collaboration with peers and teachers. Harasim, (2012) also held that the learning progressions, particularly in Facebook Groups, were consistent with the rudimentary principles of social-constructivist pedagogy, that places an importance on the role of collaboration and interaction, principally amid the learners. Furthermore, Sazalli (2015) report that Facebook Groups had the valuable feature of the social media that gives students opportunity to develop sense of community and connection beyond the classroom setting (Sazalli, 2015). Other reasons for using Facebook as state by Qmul (2018) includes easy sharing of references, links and resources, setting up of the group and Facebook integration with mobile internet means a student can engage in discussions and materials using their tablets and smartphones.

Google Hangout, according to Isaacson (2013) widespread, is free, open, and setting up a Google+ account, which is required to use Hangouts is simple. Additionally, Isaacson report that many students and instructors may already have a Google+ account as well as a Gmail account and are likely to be conversant with Google Docs, Gmail and YouTube, which are some of the applications that support the Google Hangout experience. Another reason is that Google+ permits users to separate their networks into circles users can retain their privacy (Kobayashi 2015 and Isaacson 2013). Some educators have also incorporated Google hangout and hybrid classrooms online (Isaacson, 2013; Roseth, Akcaoglu and Zellner, 2013, Fidalgo, et al. 2014).

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In addition, Google Hangouts available through Google Plus (Duffy, 2013). Some instructors have incorporated it into and hybrid classrooms online (Isaacson, 2013; Roseth, Akcaoglu and Zellner, 2013). Google Hangouts is similar to Skype, as it offers a free audio/video conference with capability for text chat (Magee, 2019). Equally the programs provide a free mobile app, which makes it easy for Android, iPad and iPhone users to access the applications (Isaacson, 2013; Roseth, Akcaoglu and Zellner, 2013). Unlike Skype, Google Hangouts is accessible open for a group conference (Fidalgo et al, 2014). Video conferences that are recorded on Google Hangouts can be uploaded to YouTube which can be shared (Kobayashi, 2015; Google Inc., 2018). In addition, Google Hangouts allows screen captures; users can separate their links, retain privacy, screen shares and remote desktop control (Kobayashi, 2015; Google Inc., 2018).

WhatsApp, according to Gon and Ruweka, (2017), is a mobile application that is free and works across numerous platforms like android phones and iPhone. Furthermore, Gon and Ruweka (2017) report that since WhatsApp uses the internet facility, in real time much information can also be accessed, and knowledge sharing through technology is appropriate and fast. According to Alenazi (2017); Bere (2012); WhatsApp Inc. (2017) has the following shared features:

Multimedia: it permits users to share images, videos, voice notes and text messages.

Group Chat: It can support the collaboration of up to 50 members in a group.

- Limitless Messaging: Unrestricted shared messages.
- Cross-Platform Activities: Collaborations with diverse devices (Galaxy tablets, personal smartphones, and digital assistants) can exchange messages one through several media (voice notes, videos, text, messages and pictures)
- It is free: It uses the equal internet data plan for email.
- Users Name and Pins: Username or password is required as in WhatsApp as it works through phone numbers.

Furthermore, Alenazi (2017); Bere (2012), report that WhatsApp have prospective to sustain the learning process which has impact on pedagogies, and it allows access online resources, added emphasis on student's objectivity, responsibility and creativity on their learning.

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4.7.1.2 Social Media Group Setup

The researcher would create three social media platforms before the course advertisement on the Canvas platform. A Facebook and Google Hangout Group is designed for the “*Canvas Entrepreneurship and Innovation MOOC*” (E&I) for students to join voluntarily as soon as they sign up. Students who consent to contribute in the research have a choice to join the social media invitation via web links, or open, a Facebook or Google account. Students who join the Facebook Group are required to send a friend request to the researcher who accepts the invitation to allow them to contribute, and they will maintain the same privacy settings as their profiles as they had before connecting with the group. The Facebook and Google Hangout groups will only be visible to other members of the group, whose interactions would not show on their profiles. Only the group administrator will approve the E&I MOOC participants as members. A mobile number provides an opportunity for those who decide to use WhatsApp to add to their phone contacts. The privacy setting on Facebook only permits members of the group to post and make comments (Ventura, et al. 2014).

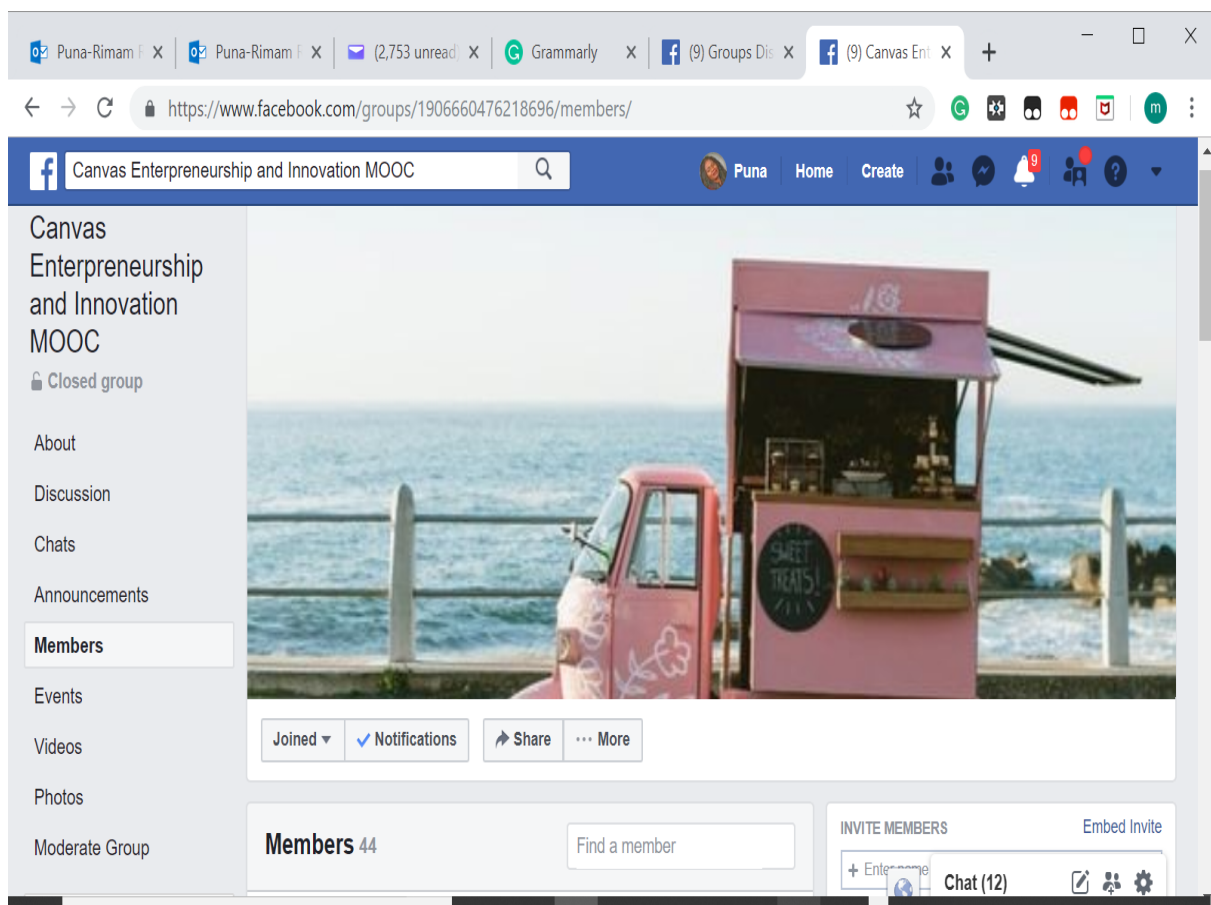


Figure 4.16: Screenshot Of Course Facebook Group Page (1)

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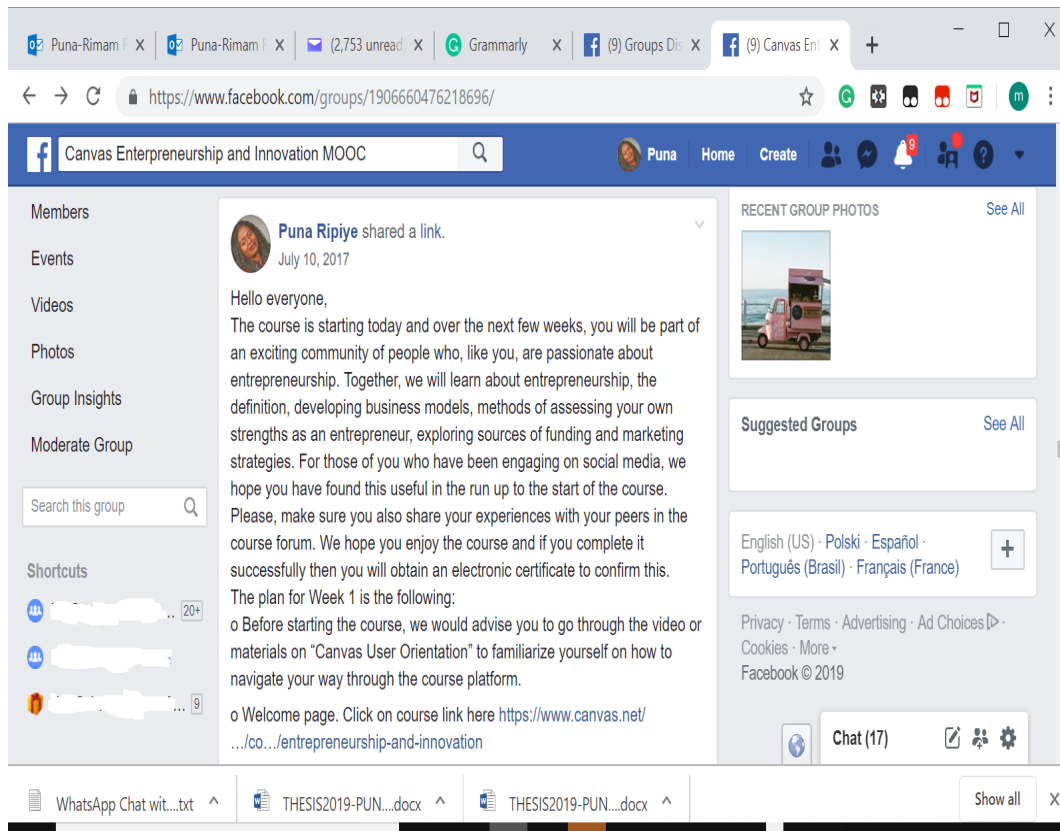


Figure 4.17: Screen Shot Of Facebook Page (2)

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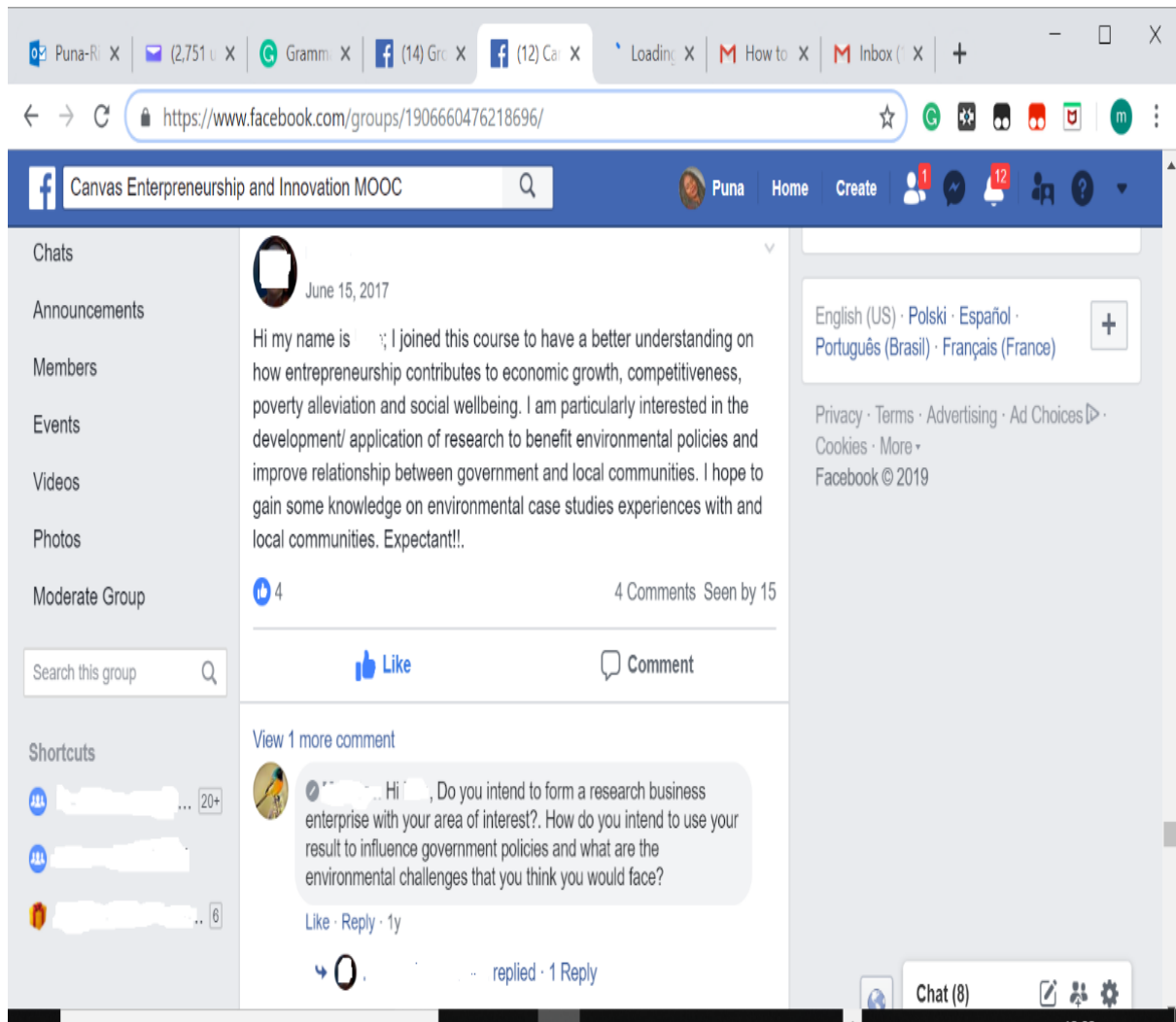


Figure 4.18: Screen Shot Of Facebook Page (3)

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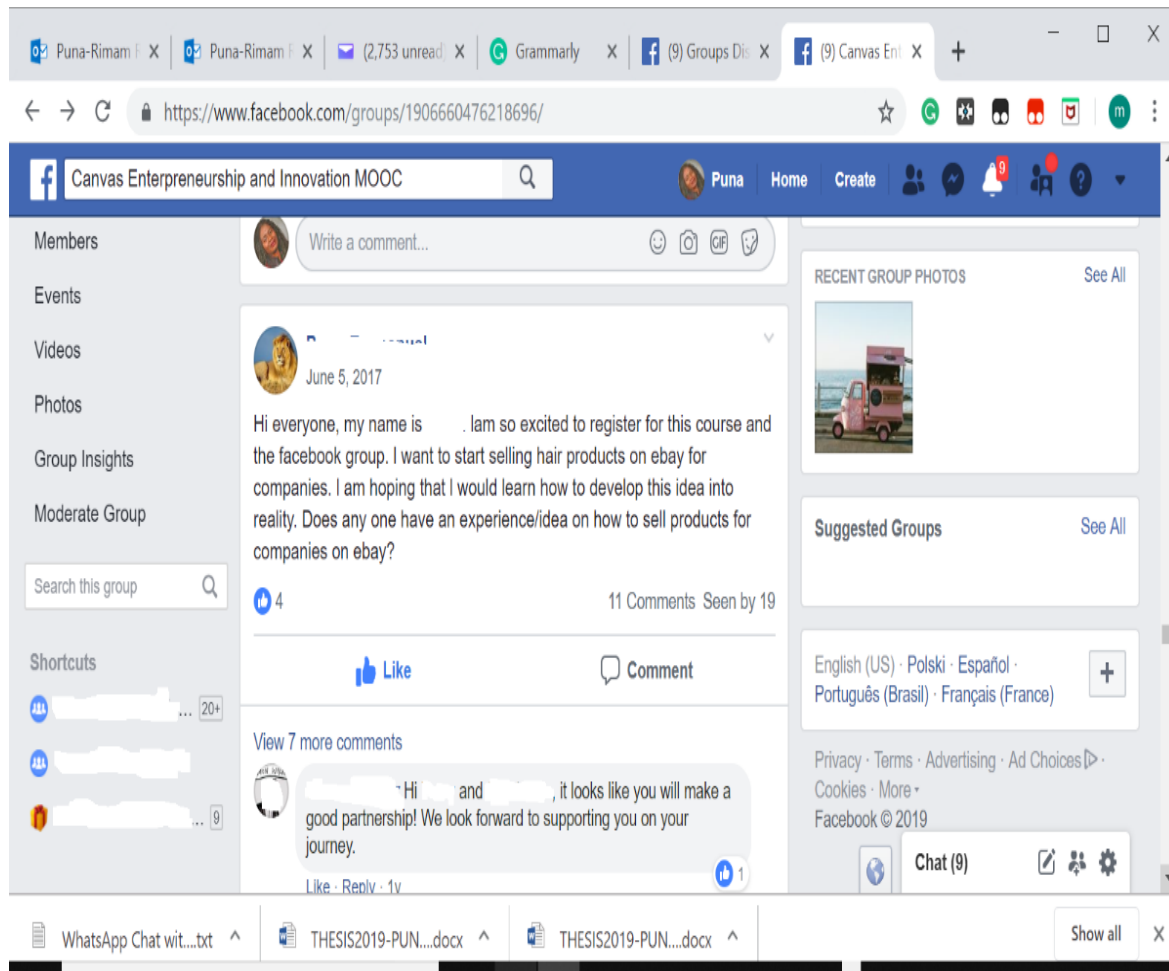


Figure 4.19: Screen Shot Of Facebook Page (4)

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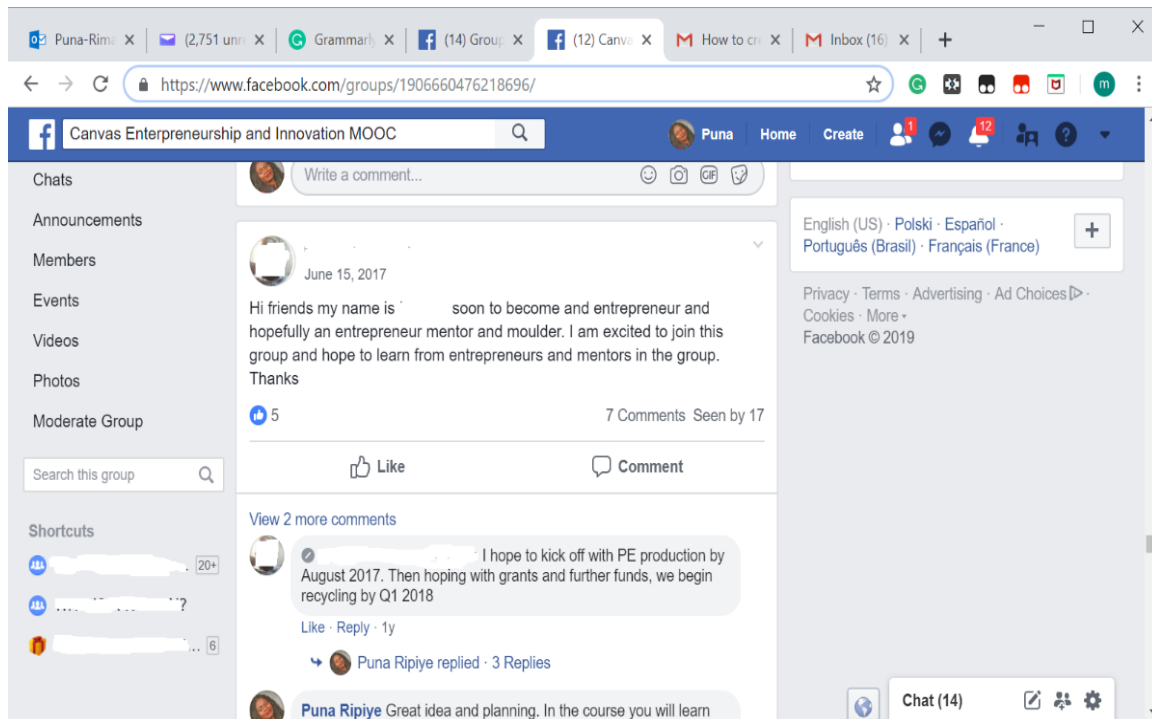


Figure 4.20: Screen Shot Of Facebook Page (5)

4.7.1.3 Google Hangouts

Learners who indicated an interest in joining the google hangout clicks a link to enable them to join the hangout.

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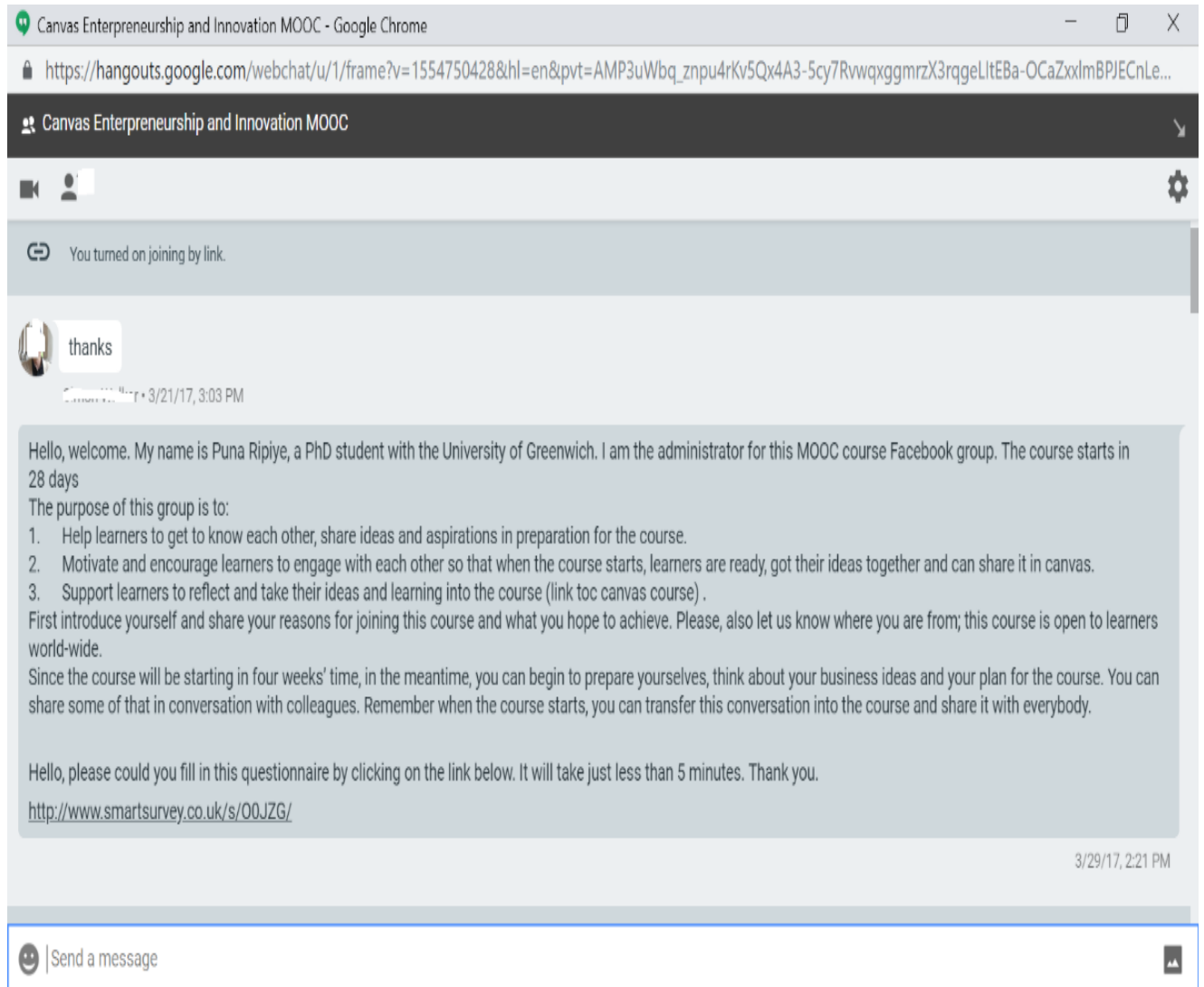


Figure 4.21: Screen Shot Of Google Hangout Page (1)

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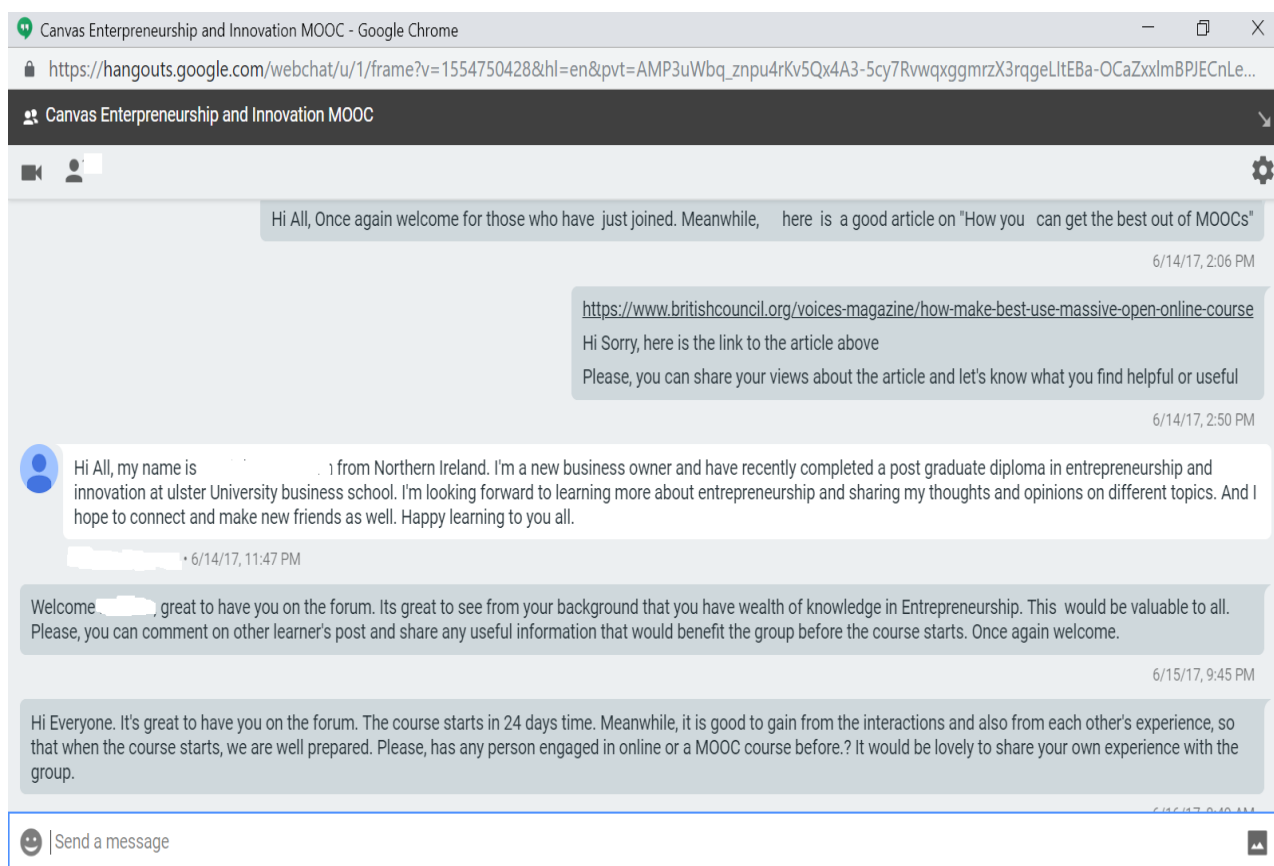


Figure 4.22: Screen Shot Of Google Hangout (2)

4.7.1.4 WhatsApp

Interested learners will send a text to the facilitator’s phone number “Please add me to the course MOOC group”. The learner will then be added to the group.

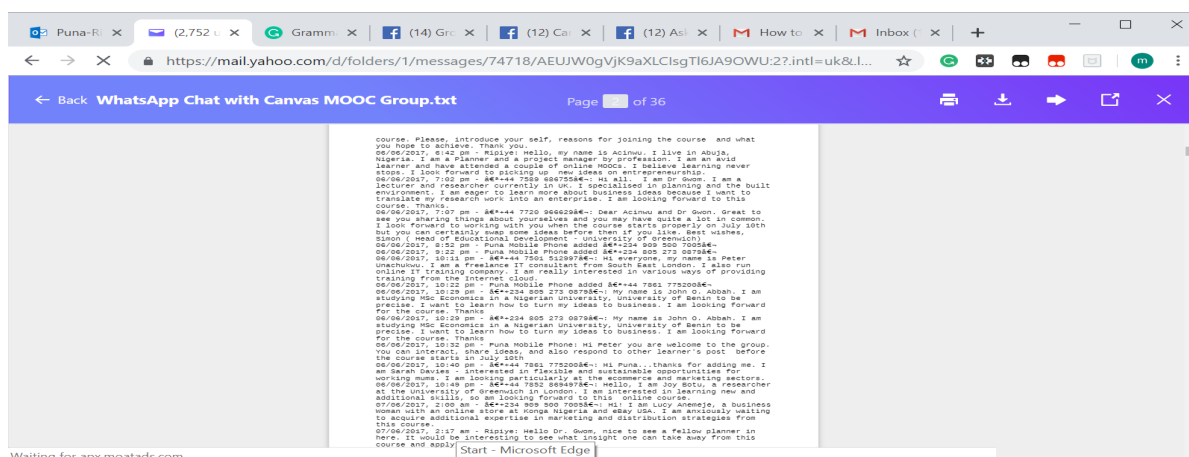


Figure 4.23: Screen Shot Of WhatsApp Group (1)

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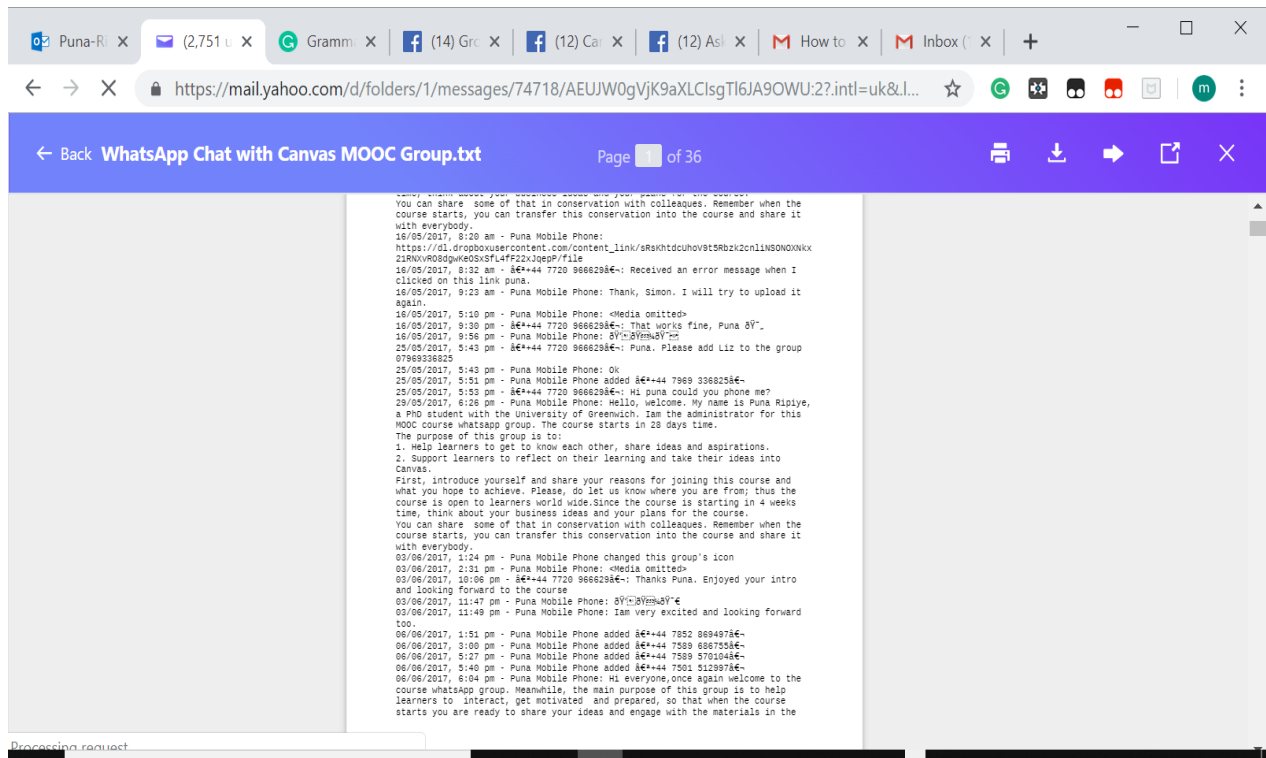


Figure 4.24: Screen Shot Of WhatsApp Platform (2)

4.8. Focus Group Design

According to Nyumba et al., (2017), the process of a focus group begins with ascertaining the aim and defining the critical objectives of the study (Breen, 2006; Green, et al., 2003; Kitzinger, 1994). Thomas et al., (1995) also mention four steps that are important in conducting a focus group. First, based on the research objectives, is to prepare the guidance for each focus group discussion session. Secondly, is to seek ethical clearance. Thirdly, the identity of the participants and synergistic relationships among participants to generate data like in the case of these study students who are interested in participating in WhatsApp group interactions and willing to discuss their business plans. Fourthly group composition depending on the principal aim of the research. Also, according to Krueger and Casey (2000), it is accepted generally that among six and eight participants are adequate, some studies have reported as few as four to fifteen participants (Nyumba, et al., 2017). In this focus group, there are no choices of participants. Instead, those on the platform are expected to respond to the survey questions.

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The University Research Ethics Committee approved ethical clearance. Responses from the participants, who sign up, interact on the WhatsApp platform and responds to the survey questions, will be used for analysis. The next section outlines the expected nature of discussions and participation in the focus group.

4.8.1 Participants, Discussions and Facilitation

The participants are the “*Entrepreneurship and Innovation*” MOOC students that will engage in the WhatsApp discussions. According to Vivian et al., (2014), online focus groups can take one of two forms: synchronous or asynchronous. Studies on online focus groups typically adopt an asynchronous online focus group so that participants will be able to contribute to the discussion in their own time (Oringderff, 2004). The discussions on the WhatsApp forum will be asynchronous as students are expected to interact and respond at their own pace and a synchronous would be challenging given, they will be in different time zones.

Lastly, two facilitators of the group will be the researcher (1) and the other, one of my supervisors, so that they could have a glimpse of what is going in the forums. The responsibility of the facilitator (the researcher) is to post focus group guidelines, weekly messages - at the beginning of the week, responding to students’ queries/questions, and intervening where necessary. Facilitator (2 one of my supervisors) will comment from time to time to clarify or elaborate on specific responses because of the busy schedule of my supervisor.

4.8.2 Focus Group Data Collection and Analysis

According to Onwuebuzie et al., (2008), the analytical techniques used in focus group data are comparison analysis (where there are sub-groups), keywords-in-context, discourse analysis and content analysis. Also, Breen (2006) report that any form of focus group data should include a summary of most important themes, network quotes and unexpected findings.

After the student's discussions, responses will be collected from the WhatsApp group by “*exporting data*” using the WhatsApp setting function (WhatsApp, 2018). The reactions of the participants will be coded for qualitative analysis and grouped into themes as described in the steps by Stirling (2001) in the above paragraph. The emerging themes will be discussed. The reason for the choice of thematic analyses is discussed in 4.8.3.

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The data will be systematically (co)analysed and (co) checked by two colleagues (PhD colleagues who are statisticians and expert in both quantitative and qualitative data analysis) to strengthen the level of triangulation (Creswell, 2009). According to O'Connor and Gibson, (2003) to make certain reliability and validity in the research process and findings, it is important to compare how the researcher categorise and code the results into themes with how a colleague would have done it.

4.8.3 Steps to Focus Group Data Analysis and Justification

According to Nyumba (2017), discussion on focus group generally produce both observational and qualitative data where evaluation can be stimulating. According to Leech and Onwuegbuzie (2007, 2008), focus group data can be analysed using qualitative analysis techniques. Charmaz (2006); Glaser (1978); Glaser and Strauss, (1967), Strauss, (1987), analysis of content Morgan (1988) and analysis of discourse (Potter and Wetherell, 1987). The use of ethnographic and content analytic techniques to examine focus group data discussions was also suggested by Morgan (1988) since it offers the researcher with a prospect to get both and quantitative and qualitative information through a coding structure, which consist of three elements leading to diversified content analysis. Besides, thematic analysis, according to Stirling (2001), is another robust, analytic tool that is common to many approaches to analyse qualitative data and is used in many approaches to qualitative analysis. After examining all these approaches, as outlined in 4.8.2, thematic analysis will be used. Students are expected to interact and respond to the question by making comments and statements. Therefore, to organise, categorise and bring out the meaning in the data, thematic analysis is more appropriate as compared to other approaches like content, comparison and discourse analysis. According to Stirling (2001), applying thematic networks is a way of organising qualitative data, as it try to find to uncover the themes significant in the text at different levels. It also facilitates the structuring and description of these themes. Besides, according to Altheide and Johnson (1994) the thematic analysis method precisely, brings to light the meaning, magnitude and richness of the independent knowledge of social media.

Stirling (2001) also describe the five steps involved in the thematic analysis, which includes, coding the responses, identifying the themes, construction of the network, defining and exploring, summarising the themes and interpreting the patterns.

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Lastly, the thematic analyses will be used to analyse objective 6. Therefore, since the focus group study is an extension to answer objective 6 and for consistency, thematic analyses will be used.

4.9 Experimental Variables, Research Question and Hypotheses

Generally, this study includes dependent and independent variables as well as a research question and hypothesis. This section first defines the independent and dependent variables that will be obtained from the study and then the experimental design of the research. An alternative and null hypothesis is created for each of the objectives to analyse it statistically.

Research objectives	Variables	Sources of Data/measures
1. To find out if early engagement in social media increases the number of students who starts the MOOC from those who have registered.	Total number of learners who registered in the course because of early engagement in Social Media	Motivation Questionnaire(Q2) My early engagement in the course social media forum before the course started, motivated me to begin the course? Social media forum & canvas dashboard. Will extract data on social media engagers who started the course and those who did not engage in social media and started.
2. To find out how motivated students are engaging in the course social media interactions during the course.	<ul style="list-style-type: none">Motivational levels of those engaged in SM	Motivation Questionnaire(Q3) How motivated are you engaging in Social Media interactions during the course?

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3. To find out the relationship between motivational factors (intentions) of social media participants' and retention.	<ul style="list-style-type: none"> • Intentions • Completed • Not completed 	Data will be obtained from the Canvas dashboard
4. To find out if there are significant differences in course engagement between MOOC learners who engaged in the social media and those who did not.	<ul style="list-style-type: none"> • Course Engagement - No of participation, page views, activity volume, assignments (Dependent Variable) • Number in Social Media group (Independent Variable) • Number not engaged in Social Media (IV) 	<p>Data will be obtained from the Canvas dashboard</p> <p>Motivational Questionnaire (Q1)</p> <p>Did you engage in Social Media interaction during the course?</p> <p>Data will be obtained from the social media forums and canvas dashboard</p>
5. To find out if there are significance differences in retention between MOOC students who engaged in the	<ul style="list-style-type: none"> • Motivational levels (DV) • Total no. engaged in 	<p>Welcome survey Questionnaire(Q4)</p>

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course social media and those who do not.	Social Media (IV) <ul style="list-style-type: none"> • Total no. who did not engage in Social Media (IV) 	How motivated are you engaging in this MOOCs course? Data will be obtained from the social media forums and canvas dashboard
6. To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC.	Qualitative data	Motivation questionnaire

Table 2: Research Objectives, Independent And Dependent Variables, And Data Sources.

Objectives	Null Hypothesis(H_0)	Alternative Hypothesis(H_1)
1. To find out if early engagement in social media increases the number of students who start the MOOC from those who have registered.	Early engagement in social media will not increase the number of students who start the MOOC from those who have registered.	Early engagement in social media will increase the number of students who start the MOOC from those who have registered.
2. To find out how motivated students are engaging in the course social media interactions during the course.	Learners who engaged in Social Media interactions during the course will not be motivated	Learners who engaged in Social Media interactions during the course will be motivated
3. To find out the relationship between motivational factors (intentions) of social media participants' and retention.	There is no relationship between the intentions of social media participants and completion	There is a relationship between the intentions of social media participants and completion
4. To find out if there are significant differences in course engagement between MOOC	There are no significant differences in retention between MOOC learners who engage in	There is a significant difference in retention between MOOC learners who engage in social media

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learners who engaged in social media and those who did not.	social media and those who do not.	and those who do not.
5. To find out if there are significant differences in retention between MOOC students who engaged in the course social media and those who do not.	There are no significant differences in course engagement between MOOC learners who engage in social media and those who do not.	There is a significant difference in course engagement between MOOC learners who engage in social media and those who do not.
6. To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC.	Qualitative	Qualitative

Table 3. Research Objectives And Hypotheses

4.10 Ethical Issues

The ethical issues in this section are considered that arose from the design of the experimental studies, principally in the considerations of data capture and management, and user consent. The appropriate ethical standards were followed by getting approval for the questionnaires; the data capture, management, analysis process, and the user consent model from the University of Greenwich, University Research Ethics Committee (UREC) before the research took place (see consent form in appendix 1).

4.11 Reliability and Validity

According to Bryman (2012, p.717), reliability and validity are an essential part of the research. Validity as a whole refers to “*the integrity of the conclusion*”, and “*the issue of whether indicators designed to gauge a concept measure the concept*”. Besides, reliability refers to “*the consistency of a measure of a concept*” (p. 169).

According to Onwuegbuzie and Johnson (2006), validity depends upon the corresponding strengths of the use of diverse approaches, techniques, and strategies in numerous and innovative ways. They recommended using the term legitimization instead of validity in the Mixed Method Research because “some qualitative researchers (e.g. postmodernists) view the idea of validity (and the world) as representing a discredited modernist viewpoint that champions “*universal rationality, order, rules, logic, and the like*” (p. 55), and the term legitimization is also

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used by both quantitative researchers and qualitative researchers.

The questionnaires used in the study were also pilot tested by sending the surveys (link) by email to colleagues who had previously engaged in MOOCs for comments. Besides, the expert review was also obtained from a social scientist and statisticians to ensure appropriate statistical techniques will be. All the inputs and comments were used to develop the questionnaire.

The engagement rate data will be taken from the canvas dashboard, which the Canvas network defines as page view, participation, activity volume and assignments. In the MOOC, the qualitative data will be captured in the social media forums and the questionnaires and will be grouped using thematic analysis. Thematic analysis will be used because it covers the important aspects of the data concerning the research question and represents some level of pattern responses within the data set (Braun and Clarke, 2006).

According to Creswell, (2009), qualitative validity is based on determining if the results are correct from the standpoint of the researcher, the readers or participants. Therefore, the notion of reliability in this research is connected to obtaining quality information from the research instruments, which have been tested, and an excellent qualitative study helps us to understand how engagement in social media influences learners' motivation, course engagement and retention in the MOOC learning context. In the research, both quantitative and qualitative methods will be used to obtain data. In addition, in the Exit questionnaire, learners will be asked for reasons for completion or non-completion. This questionnaire is necessary because it could reveal other motivational factors that influence students' learning apart from engagement on social media.

4.12 Summary

The experimental design of the study is described in this study. The chapter also explains the reasons and justification of the experimental design, questionnaire design, and how the data obtained would answer the research question. The chapter further discussed steps to data analysis having covered the course process. Besides, it addressed the validity and reliability issues, experimental variables, research question and hypotheses. The sections also discussed the background of the first 1st MOOC and how it influenced the design of the 2nd MOOC.

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Also, it deliberated on the Social media set up and the justification for the choice of the platforms. The chapter concluded by presenting the focus group design, data collection and analysis.

The next chapter discusses the MOOC pre-course, course period phases, and social media engagement during the MOOC.

CHAPTER 5

THE EXPERIMENT-PRE-MOOC AND MOOC PERIOD

5.1 Research Context

The research was carried out through the design and implementation of a MOOC aimed at potential entrepreneurs and focussed on their development of a business model. It utilised the Canvas platform, as shown in fig 5.1 & 5.2 (Canvasnetwork, 2018), run by the Canvas Learning Management System. The Entrepreneur and Innovation MOOC was developed by the University of Greenwich and took place between 10th July to 5th September (5 weeks but extended by three weeks - a total of 57 days). The MOOC aimed to enable participants to:

- learn about entrepreneurship
- develop a business model
- to explore methods of assessing one's strengths as an entrepreneur.

Its objectives were to:

- develop entrepreneurship skills;
- produce a business plan;
- develop a 'Business Model You' canvas for individual development;
- identify and act on knowledge transfer prospects;
- recognise a business opportunity with some degree of realism;
- identify the core mechanisms for raising finance to start your business;
- begin the process of launching a new company.

All materials for learning were set in English comprising the course guidelines, quizzes (questionnaires), learning assignments, and lecture videos. The course introduces entrepreneurship and its principles. The topics comprised:

- Introduction to entrepreneurship
- Developing your business model
- Entrepreneurship and innovation
- Student Work-Peer review.

It contained seven discussion forums comprising:

CHAPTER FIVE - The Experiment-Pre-MOOC and MOOC Period

1. icebreaker
2. help and support
3. defining entrepreneurship
4. business model
5. insight for the value proposition
6. growth strategy and
7. Finance and e-marketing.

5.2 Pre-MOOC Phase

Once participants signed up for the MOOC, they had a choice to join one of the social media platforms (Facebook, Google+ and WhatsApp). All the social media platforms had a welcome message, which also communicated the purpose of the social media group. There were also guidelines on participating on the social media forums. According to Berge (2006), communicating clear objectives is crucial so that participants consider their effort in online interaction to be well spent. Every week the facilitator (researcher) posted a message on the forums. The messages included reminding learners of the purpose of the platform, encouraging participants to introduce themselves, where they come from, giving a countdown of the numbers of days remaining for the course, and encouraging them to share their conversions in the course forums once the course starts.

The Facilitators were my supervisors and me (the researcher). The facilitators engaged with students on the Facebook, google hangouts and WhatsApp group providing support by answering questions, encouraging learners to interact, ensuring that they adhere to guidelines, and what they hope to get from the course. During the pre-MOOC also, the facilitators asked the students on the understanding of learning online and encourage learners to share their experiences on past MOOC or online learning experiences, so that those who are first-timers could benefit. For instance, one of the learners asked, *“Hi All, this is my first time of taking a MOOC course. Anyone is taking a MOOC before, what are the best ways to make the most out of a MOOC?”*

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One of the learners replied:

“I have taken a couple of MOOCs over the years. One thing I try to do always is to stay motivated enough to continue. I need to keep my mind focused on what I hope to learn else, my interest will wane. Therefore, I select my MOOCs carefully. Another is ensuring I have time for the MOOC. I try to anticipate the length of time I need and find a way to fit it into my schedule. Finally, I enrol in MOOCs that can help sharpen my skills and make me a better person. So, I try to practice what I learn in MOOCs.”

In addition, another learner responded, *“This information is beneficial; it is also going to help to prepare myself for this course”*. Also, in response to this, the facilitators posted a link to an article *“How to get the best of MOOCs published by BBC”*. It helped the orientation of the learners as they were able to support their peers by dialogue, and as the MOOC course start date drew closer, one could see from the discussion threads that for some first-timers in MOOCs, their confidence grew and a week to the start date, many were eager to start.

5.3 MOOC Period

The first day of the MOOC, on the welcome page, a short intro video message from the E & I MOOC team welcomes participants. Also, on the welcome page, before learners start, they are advised to visit the *“Key Course Information”* page to become familiar with the learning outcomes and how the programme works. The information on *“Canvas user orientation”* guides participants to find their way around the system.

To navigate, participants could use the links to “Modules” that contained the learning materials assessment information, forums and all the surveys. Once a participant clicked on the module page, it took them to Module 1, which provided them with the introductory and essential critical course information. Students were expected to complete the welcome survey and proceed to the icebreaker forum where they introduced themselves. A video messaging tool is built into each Canvas forum to enable learners to introduce themselves and provide such information as to where they are in the world and their interest in undertaking the MOOC. This tool reduces the reliance on technical skills of recording video separately and uploading it. An explanation was also given on how to use the tool. The learners can see all the modules, forums and activities required to complete a module. All five modules had their discussion forums. On each forum, the facilitators directed learners to ask questions around the content of the MOOC, find support, deliberate on issues around course activities, and share links to the resources online.

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Students were expected to follow a linear path through the modules and engage in discussions and share their views and experiences, concerning the topics, although they could also navigate their pathways, which many did. The course content comprised text and video lectures accessed primarily through YouTube channels. Suggested reading materials, discussion forums, assignments, and questions complemented these. All video lectures were downloadable and accessible with each accompanied by a transcript. In week three, learners were requested to complete the User Experience Survey, which was provided by Canvas. It was assumed that by the 3rd week, participants would have gone through most of the materials or be halfway through the course, with sufficient understanding of the MOOC to evaluate their experiences to date. Participants were requested to fill the Exit Questionnaire - when they exited the MOOC. This was taken either at the end of the course or when a participant decided that they had as much out of the MOOC, as they desired and left 'early'.

Two types of assignments will be used relating to the *Value Proposition* and the *Business Model*. Learners were required to submit the business model assignment for peer assessment in the 4th week because they would have gone through the modules and developed the business model. Participants are expected to upload their assignments to review one another's work and make comments.

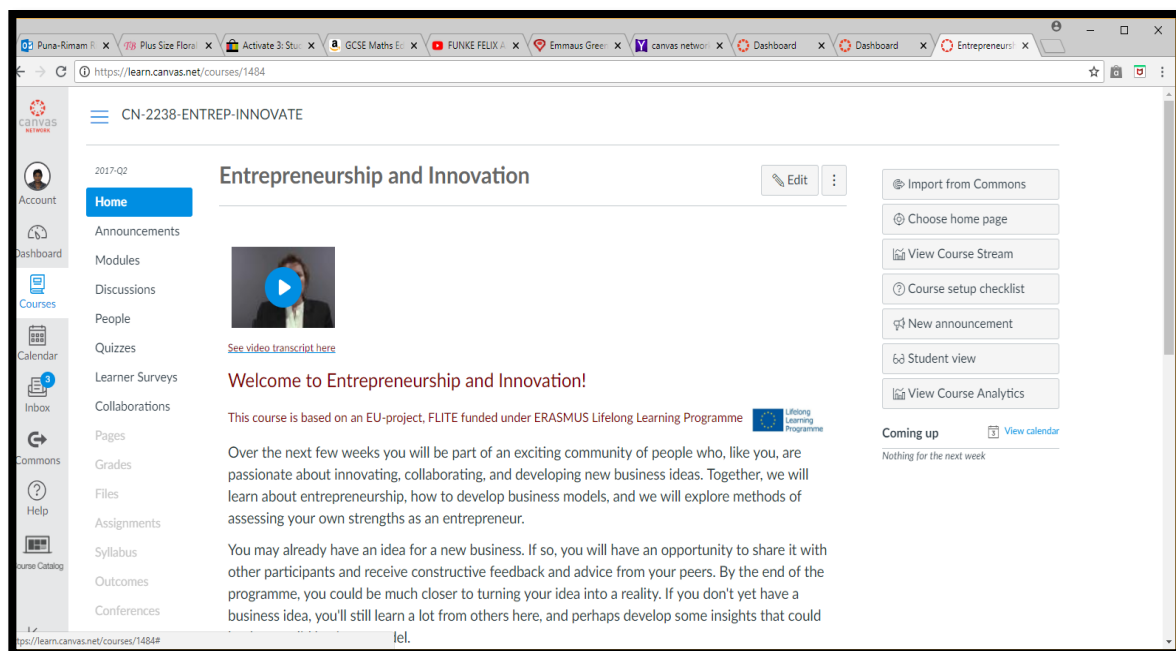


Figure 5.1: Screenshot Of The Course Welcome Page

CHAPTER FIVE - The Experiment-Pre-MOOC and MOOC Period

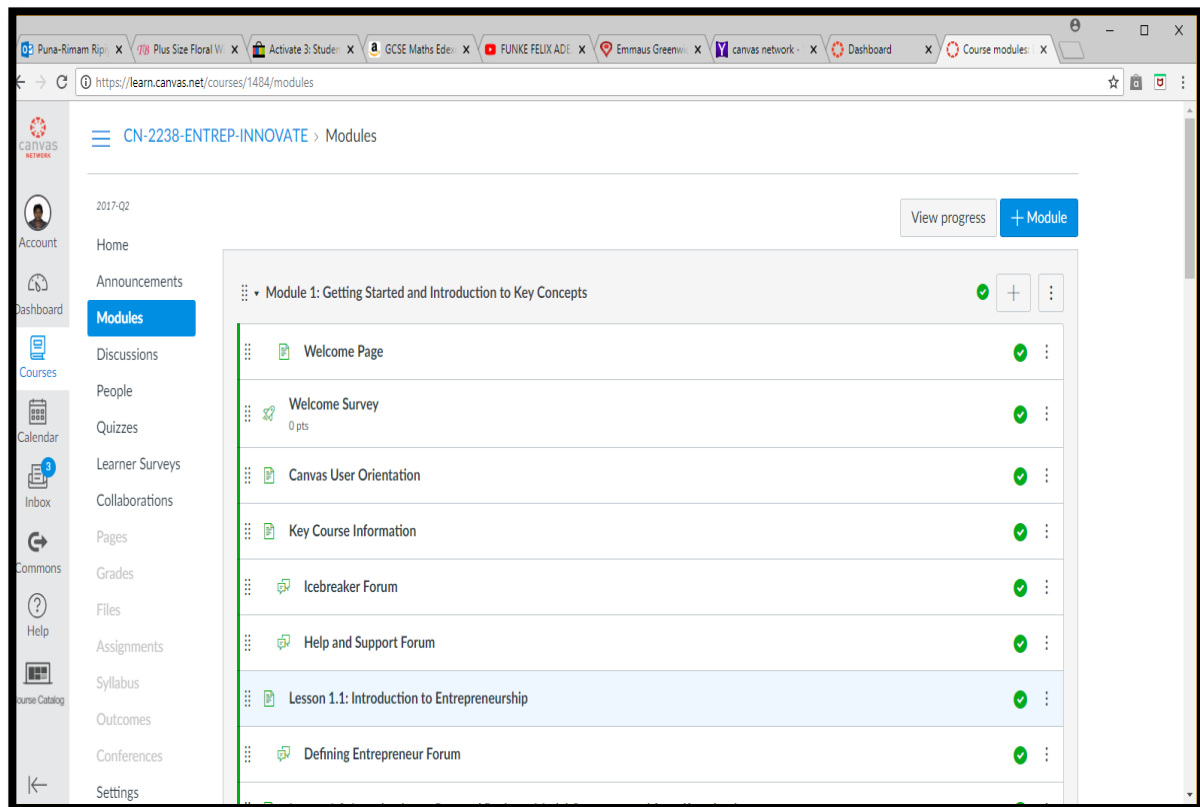


Figure 5.2: Screenshot of the Course Module Page

5.4 Week 1: Icebreaker Forum: Introduction to Entrepreneurship

In the first week, the course starts with the Icebreaker forum. The Icebreaker forum is designed to get participants used to working with forums and encourages participants to introduce themselves using the video messaging facilities. Students present themselves in a short 1-minute video message. The introduction includes who they are, where they are based and their business dreams and ventures. Course facilitators encouraged participants to contribute to forums and share exciting links around weekly topics.

5.5 Week 2: Developing a business model

The second week's topic was on developing a business plan. The topics under this section included *Using the Osterwalder Canvas; Value proposition; and validating your hypothesis*. A short video message by the instructor welcomed participants to the second week and briefly explained the topic for the week and what the participants would expect to learn: how to develop their business ideas using Osterwalder Canvas; how to achieve a good product-market fit, using

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the Value Proposition Canvas as a tool for assessing customer needs; and how to test the validity of their business model hypotheses using the Validation Board tool (Osterwalder, 2015).

The learning outcomes in week 2 were foundational for succeeding in the whole course. Participants learnt how to use the Osterwalder Canvas (an example of an approach that helps participants think through the different aspects of their start-up business idea). Their output enabled participants to start to develop their business plan, which they produced in Module 5 of the course.

The topic “Osterwalder Canvas” “described how to use the Osterwalder *Business Model Canvas* which is a modest graphical template defining nine important components: Customer relationships, Customer segments, channels, value propositions (such as self-service or personal assistance), partnerships, revenue streams, activities, resources, and costs (Osterwalder, 2018).

The participants were able to watch a video by Alexander Osterwalder, which introduced and explained how to use the Business Model Canvas. After that, participants used the Business Model Canvas template using MS Word or PowerPoint to create their own Osterwalder Canvas. Participants could also choose to use their favoured search engine to search for examples of completed Osterwalder Canvases and share links with peers on the Business Model Sharing Forum. After participants completed their Osterwalder Canvases, they shared them with their peers in the Business Model Sharing Forum. To encourage the spirit of constructive collaboration, participants were encouraged to remark on individual’s work and recommends improvements to the business model they reviewed.

5.6 Week 3: Entrepreneurship and Innovation

Week 3 of the course explored best practices in entrepreneurship and innovation, marketing, strategic planning and finance. Upon successful completion of the module, participants were expected to evaluate and discuss insights and advice from successful entrepreneurs. The purpose of the session was to develop further insights into the key elements of best practice in entrepreneurship and to inspire participants’ thinking about their entrepreneurial projects (Canvas, 2017).

The task set was to watch videos by one of the world's most prominent entrepreneurs, Sir Richard Branson, who shared some valuable tips and advice for becoming an entrepreneur.

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Other videos included experts discussing business incubation and project management. Students chose one favourite insight or piece of information from the learning materials that resonated with them as entrepreneurs. They also selected one contribution from another participant that interested them and discussed how they intended to use the advice in their present or future businesses with their peers.

Participants watched videos, shared insights with one another through postings on the Insight Forum. They discussed why they chose to share specific insights and why it meant something of importance to them. Other activities included browsing contributions from participants in the Insight Forum

5.7 Week 4: Student's work developing a business plan

The fourth week was a continuation of the development of participants' business models. At this stage, participants were developing their business plans to a stage where they could be further critiqued through a peer-review process. The process aimed to provide participants with external feedback in the form of constructive criticism, which could be used to improve their business plan.

Students were expected to upload their completed business plans to the forum. Peers and tutors provided feedback on the work, either by posting comments or by using peer review feedback forms. The tutors encouraged participants to give feedback and conduct critical peer review. Tutors used the same forum to comment on the work so that responses were visible to all participants. The forum opened for one week beyond the end of the submission deadline so that participants could share and review each other's work.

5.8 Week 5: Student work - peer review

Developing business plans continued in week 5. To help participants engage in the peer review process, the following questions aimed to stimulate comments and responses:

- Was the business plan complete?
- Was the material ordered in a manner that was reasonable, clear, and to follow easily?
- Did the author clearly describe and explain their business idea?

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- Did the author comprehensively cover all aspects of the business plan, and their route to market? If not, what is missing?
- Was the author(s) writing style clear? Were the paragraphs and sentences cohesive and convincing?
- Were there any grammatical or spelling problems?

5.9 Week 6-8 (Extension): Continuation of participant work - peer review

The course was extended for a further 3 weeks in response to popular request for additional time to complete their work. During the extension period, participants continued to engage in peer review.

5.10 Tools and resources available the in E& I MOOC

The MOOC was organised in a way that enabled students to follow a path and take advantage of instructional guidance to use the full range of tools; they could engage in the activities and with the materials through the platform's video messaging service, discussion forums and YouTube links etc.

5.11 Video and audio messaging service

The messaging facility tool allowed participants to produce video and audio recordings and post them directly into the forum. Students used this facility, for example, to record their welcome messages.

5.12 Discussion Forums

Students used the discussion forums to post comments and responses to one other. There were seven discussion forums in all. The business plan was uploaded to the participants' support forum for peer review, where course instructors could also make comments. The purpose of the forums was to encourage sharing and networking between course participants.

5.13 YouTube

Participants used the YouTube features to embed video and share with others on the forum.

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5.14 Questionnaires

Three questionnaires were used in the study - the '*Welcome survey*', the '*Motivational questionnaire*' and the '*Exit questionnaire*'. After reading the welcome message, participants logged and completed the welcome survey. The motivation questionnaire was administered in social media forums because it was meant for students who engaged in social media. The Exit questionnaire was located at the finish of each module for learners who wished to exit the course early or have completed the course.

5.15 Feedbacks

Students received feedback through comments from peers and instructors for their business model and value propositions. Some of the feedback related to issues stemming from videos they had watched, or the course is learning materials.

5.16 Course Assessments

The most common assessments in MOOCs are automated assessments and peer assessments (Xiong, et al., 2015). One problem with the automated assessment is that it does not test the academic skills of participants required for a digital age, such as innovative or new thinking (Bates, 2015). According to Colman, (2013) and Barcena et al., (2014), inadequate peer assessment is one of the explanations why participants drop out of MOOCs. Although peer-to-peer feedback is beneficial, according to Liu and Carless, (2006), it still poses a challenge for participants and instructors. The course assessment strategy used in the MOOCs consisted of submitting a business plan, which was reviewed by fellow participants, and completing all three questionnaires.

5.17 Certification

Participants who completed all questionnaires and submitted a business plan were awarded a Certificate of Participation from the University of Greenwich.

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5.18 Social Media Engagement during the MOOC

Throughout the MOOC, participants who had joined the additional externally provided social media platforms continually engaged in sharing and discussion. Students exchanged ideas, created resources and actively engaged, especially in the WhatsApp and Facebook forums.

All questions asked by the learners regarding the course in the social media forums were referred to the course Help and Support forum by the facilitators. The facilitators made comments when it was deemed necessary to clarify issues or comment on inappropriate materials posted, continually reminding the learners to share their experiences, links and any content posted on the social media forums on the course forums. This was to allow other learners to benefit from additional information and resources. No official course materials were shared in the social media forums. This is to help and encourage learners to focus their efforts on sharing with their peers on the course forums.

No of Days	Social media forums	Role of Facilitator	Social Media Forum
Pre-course Period Countdown day 28-22	Hello, my name is Puna Ripiye, a PhD student with the University of Greenwich. I am the administrator for this MOOC course social media group. The course starts in 28 days The purpose of this group is to: 1. Help learners to get to know each other, share ideas and aspirations in preparation for the course. 2. Motivate and encourage learners to engage with each other so that when the course starts, learners are ready, got their ideas together and can share it in canvas.	Posting video, welcoming participants, explaining the purpose of the group and encouraging them to reflect on their plans for the course.	Same as in all forums Add same in all SM forums

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	<p>1. Support learners to reflect and take their ideas and learning into the course (link to canvas course).</p> <p>2. First, introduce yourself and share your reasons for joining this course and what you hope to achieve. Please, also let us know where you are from; this course is open to learners' worldwide.</p> <p>3. Since the course will be starting in four weeks, in the meantime, you can begin to prepare yourselves, think about your business ideas and your plan for the course. You can share some of that in conversations with colleagues. Remember when the course starts, you can transfer these conversations into the course and share it with everybody</p>		
Countdown day 21-15	<p>The course starts in 21 days</p> <p>Thanks for introducing yourselves. Please share with fellow learners your experiences if you have engaged in online learning before and how you intend to approach this course and get the maximum benefit from it. Share this with other learners and those who have just joined this week can still introduce themselves. Also, take some time to</p>	<p>Posing video, welcoming participants in the second week, asking the participants about how the week went, and encouraging them to share their plans, aspirations for the course based on their responses.</p>	<p>Share same article in other SM forums</p> <p>Share same in other SM forums</p>

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	<p>look at the comments from other learners and respond to their opinions.</p> <p>Please, share your views about the articles and let's know what you find helpful or useful</p> <p>Good morning everyone! Thank you for sharing your ideas and comments very helpful.</p>	<p>Responding to the article post</p> <p>Commenting on share article</p> <p>Explaining how the MOOC works</p>	<p>Share same in other SM forums</p>
Countdown day 14-7	<p>The course starts in 14 days</p> <p>Please, keep discussing and continue to share your experiences and useful resources with other learners.</p>		<p>Same as in all forums</p>
Countdown day 6-0	<p>The course starts in 6 days</p> <p>Well done for posting all your comments and contributions. I am very sure you have gained a lot from your interactions with each other and now well prepared to start the course. Meanwhile, we encourage you to take any materials or ideas you have shared to canvas forum so that the other participants who were not engaged in your social media group can benefit from them.</p>	<p>Posting the video, commending participants for their interactions so far and encouraging them to share any materials, discussions on canvas. Reminding them that canvas is the official forum for the course discussions.</p> <p>Respond to any question.</p>	<p>Same as in all forums</p>

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<p>Course Goes Live</p> <p>Week 1</p>	<p>Welcome to the first week of the canvas course (link). If you have not already been engaging with this Facebook group and have just joined, please feel free to introduce yourself and engage with other learners. We encourage you to share all the materials you have been discussing in this group with other learners in the canvas course forum (link) so that we can all benefit. If you have any questions, please send me a message (Puna) on the canvas course forum.</p> <p>Please complete this welcome questionnaire (link). If you decide to leave the course at any stage, we would be grateful if you would complete this short exit questionnaire (link)</p> <p>Some participants have complained of login issues. Please, be reminded that because of different time zones, some of you have to wait for a few ones to log in.</p>	<p>Posting welcome video and commending them for starting the course. Also, reminding them that the official discussions of the course would be on canvas. Meanwhile, encouraging them to share a conversation so far on canvas with other learners.</p> <p>Posting links to motivation questionnaire</p> <p>We are reminding participants that because of different time zone some may have to wait a few hours to log in.</p>	<p>Same as in all forums</p> <p>Same as in all forums</p>
<p>Week 2</p>	<p>Developing a Business Model</p> <p>Welcome to week 2. We hope you are getting to grasp with the course and are developing your business</p>	<p>Continuous encouraging participants to share materials and</p>	<p>Same as in all forums</p>

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	<p>model. Please do not forget to share your reflections and thoughts on the Developing Business Model forum with your colleagues on the canvas course (link).</p> <p>Please complete the user experience survey. (link)</p> <p>If you decide to leave the course at any stage, we would be grateful if you would complete this short exit questionnaire (link)</p>	<p>discussions on canvas.</p> <p>Commenting on relevant issues and answer any questions.</p>	
Week 3	<p>Entrepreneurship and Innovation</p> <p>Welcome to week 3. Well done for getting this far on the course. If you have any questions, please do not hesitate to share them by posting them in the canvas course forum (link). Meanwhile, please do not forget to share your reflections and thoughts on the Entrepreneurship and Innovation lessons you have learnt so far with your colleagues on the canvas course.</p> <p>If you decide to leave the course at any stage, we would be grateful if you would complete this short exit questionnaire (link)</p> <p>Please, if you watched the videos on Jack Ma (CEO Alibaba Group) advice to Entrepreneurs, we would</p>	<p>Same as above</p> <p>Posting links to motivation questionnaire</p> <p>Posting reminder to share video</p> <p>Posting reminder</p>	<p>Same as in all forums</p> <p>Same as in all forums</p> <p>Same as in all forums</p>

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	<p>love you to share what lessons you have learnt.</p> <p>Reminds learners of rules in the forum not to post irrelevant materials</p>		
Week 4	<p>Developing a Business Plan</p> <p>Welcome to the fourth week of the course. Well done for all your contributions. I am sure you are learning a lot from the peer review of one another's work. We are getting closer to the end of the course. Please, do not forget to share your reflections, discussions and thoughts on the business plan with your colleagues in the canvas so that we can get the maximum benefits. If you decide to leave the course at any stage, we would be grateful if you would complete this short exit questionnaire (link)</p> <p>Dear all, as you no doubt are aware, Puna is researching the efficacy of social media to support participants on MOOCs. As far as we know, this is the first time that WhatsApp is being used in this way, so we are keen to understand its impact and future role. We would, like to run a virtual 24-hour focus group with all users in this group this Saturday.</p>	<p>Same as above</p> <p>Posting questions related to the research to obtain qualitative data.</p>	<p>Same as in all forums</p> <p>Same as in all forums</p>

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	<p>This will comprise two short questions. 1. Why you chose WhatsApp 2. The impact it has on your learning. We would be very grateful if you could reflect on these questions and contribute answers on Saturday. Kind regards. Simon</p>		
<p>Week 5</p>	<p>Well done everyone for making it to the end. This is the final week officially, but the course has been extended to 3 weeks.</p> <p>Please, do not forget to fill the Exit Questionnaire.</p>	<p>Wrapping up and answer any questions. Remind learners to fill questionnaires.</p> <p>Post links to exit questionnaire</p>	<p>Same as in all forums</p> <p>Same as in all forums</p>
<p>Week 6-8</p>	<p>Hi, the course has been extended to another three weeks. Please make sure you log in to the course forum, upload your business plan, and comment on others.</p> <p>Please, share your experiences. What are you taking away from the course and how you intend to use it in your business?</p> <p>Post appreciation messages</p>	<p>Continually reminds participants to complete their business plan in the course forum and comment on others/share experiences</p> <p>Reminding participants to share</p>	<p>Same as in all forums</p>

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		their experiences and fill exit questionnaires	
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Table 4: Schedule of communication in social media platforms

5.20 Summary

This chapter describes the pre MOOC and Course period. It explains in detail the weekly activities on social media engagement before the course start. Also, it represents the weekly schedules of the course Modules and activities associated with each of the modules. The chapter also explains the tools and resources available in the MOOCs for students to use during the course period. In addition, it explains the questionnaires and the different stages students filled the surveys. The chapter further discusses the schedule communication in social media during the MOOCs schedule.

The next chapter revisits the research question and how the data obtained were analysed to answer the research question. This chapter describes the pre-MOOC and Course period.

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It explains in detail the weekly activities on social media engagement before the course start. Also, it represents the weekly schedules of the course modules and activities associated with each of the modules. The chapter also explains the tools and resources available in the MOOCs for students to use during the course period. In addition, it explains the questionnaires and the stages students were required to fill it. Having covered the course period, the chapter further discusses the schedule communications on social media during the MOOCs schedule. The next chapter revisits the research question and how the data analysed answers the research question.

CHAPTER 6

ANALYSIS OF EXPERIMENTAL STUDIES

6.1 Background

This section revisits the research question, aim and objectives of the research outlined in Chapter 2, and deliberates if the objectives were achieved and how the research question transformed during the investigation. Section 6.1.1 reports the observations and data from 289 (out of 450) active participants in the MOOC study, which was used to experiment and measure whether engagement with social media would have an effect on learner motivation and retention.

The obtained data in the studies were examined through the research objectives, which are listed earlier in Chapter 4 Table 3, by either accepting or rejecting the null hypotheses. For statistical analysis, the output of the statistics regarding the MOOC was generated from the IBM software package (SPSS). The generated data was collected from the studies were imputed into SPSS. Having entered the variables as numbers into SPSS, to choose which statistical method to apply for the data analysis, the method for examining if the data has a normal distribution was undertaken.

Section 6.1, 6.2 & 6.3 discusses meeting the research objectives and the MOOC and social media data. Section 6.3.1 also describes the data on motivation and section 6.4 describes the methods used to examine the data and also why various approaches were selected for ascertaining if the data came from a population that is distributed normally. On identifying the normality of the data and in accordance with the related research objectives, each dataset was then interpreted by using a non-parametric statistical measurement (i.e. Mann-Whitney U). The section also discusses the correlations between motivation and course engagement variables/retention. Lastly, this chapter also reflects the results of the qualitative data (the focus group) in section 6.6 and summaries of the chapter.

6.2 Meeting Research Aim And Objectives

The research question of this study is:

What is the impact of social media engagement on learners' motivation in MOOCs?

Six different objectives were set to answer the research question.

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The first objective was: *To find out if early engagement with social media before the course begins will this increase the number of students who start the MOOC from those who have registered.*

This objective was accomplished by literature reviews and outlining the problems of MOOCs drop out. Secondly, by engaging learners in social media before the course began. Data was obtained through a questionnaire from those who participated in social media before the course started. The data collected was analysed. Achieving these objectives provided insight for recognising the necessity to support students at the signup the stage in MOOCs to motivate them to start the course.

The second objective was *to examine how engagement with social media affects learners' motivation within a MOOC.*

This research objective was attained by identifying and discussing how social media was used in MOOCs by researchers. Understanding this objective was a vital step in the research as it emphasized how other researchers had used various ways to motivate students in MOOCs. Quantitative and qualitative data were attained through the motivation questionnaire from those who engaged in social media. The data collected analysed later in this chapter.

The third objective was *to find out the relationship between motivational factors (intentions) of social media participants' and retention.*

This research objective was achieved by obtaining data from the welcome survey, the social media forums of participants, and Canvas dashboard. The data collected is analysed later in this chapter.

The fourth objective was *to find out if there are significant differences in course engagement between MOOC learners who engaged in social media and those who did not.* This objective was achieved by literature review and identifying various variables of course engagement as it relates to canvas measurement of course engagement. Data was obtained through the canvas dashboard on course engagements for those who engaged in social media and those who did not. The data collected is analysed later in this chapter.

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The fifth objective was *to find out if there are significant differences in retention between MOOC learners who engaged in social media and those who did not*. This objective was achieved just as described in objective 4. Data was obtained through the canvas dashboard on retention for those who engaged in social media and those who did not. The data collected is analysed later in this chapter.

The sixth objective was *to find out the benefits and drawbacks of engaging in social media alongside studying a MOOC*.

This objective was realized by obtaining qualitative data (motivation questionnaire) from the social media engagers, and for the focus group, data were obtained from WhatsApp chats. The data collected were analysed using thematic analysis to code learners' responses.

6.3 MOOC DATA

6.3.1 Comparison between the 1st and 2nd MOOC.

Below is the summary of the 1st and 2nd MOOC.

	Entrepreneurship & Innovation, MOOC.	1st MOOC (Bacon, et al 2015)	2nd MOOC
1	Number registered	1581 signed up	450 signed up
2	Number started	752(50%) started	289 (64%) started
3	Duration	8 weeks	Officially 5 weeks (extended 3 weeks more)
4	Modules	8 modules	5 modules
5	Pedagogy	No course social media platform	Use course social media before and during MOOC (Facebook, Google Hangout and WhatsApp) (cMOOC)
6	Completion criteria	Submit business plan and attempt quizzes	Submit business plan and completed 3 questionnaires

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7	Completion rate	26 completed (3.5%) (less than 10%=those who started the course and completed)	44 completed (23) ($\frac{23}{94} \times 100 = 24.5\%$) engaged with social media); 21($\frac{21}{195} \times 100 = 10.8\%$) did not engage with Social media) Overall completion (15%)
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Table 5: Comparison of 1st and 2nd MOOC.

2. MOOC Data Summary

450 students signed up for the MOOC course. Out of this, 289 (64%) started the course, of whom 94 (32.5%) signed up for social media while 195 (67.4%) did not. 161 (35.8%) out of 450 did not start the course. This immediately shows improvement against the research, which shows that typically 50% of students who sign up do not start the course (Bacon, et al., 2015; Jordan, 2014). In some few cases, more than 50% of active learners begin in the first week like the Edinburgh MOOC (MOOCs@Edinburgh, 2013). Besides, the French Coli Centrale de Lille MOOC, where a high start and completion rate of over 50% was recorded. Some of the factors reported for these levels of retention were reshuffling some of the structure of its courses, and fee charges (Edu4me, 2018). In a course where fees are charged, more motivated students are likely to sign up as they are committing money. In this study, 64% of students starting the free course, therefore, shows an increase from the norm. Also, the overall completion rate is 44 (23 SM and 21 NSM) out of 289 (15%) completed. 44 completed (23) ($\frac{23}{94} \times 100 = 24.5\%$) engaged with social media); 21($\frac{21}{195} \times 100 = 10.8\%$). According to (Jordan 2014) most free MOOC have average completion rate of 10%.

CHAPTER SIX - Analysis of Experimental Studies

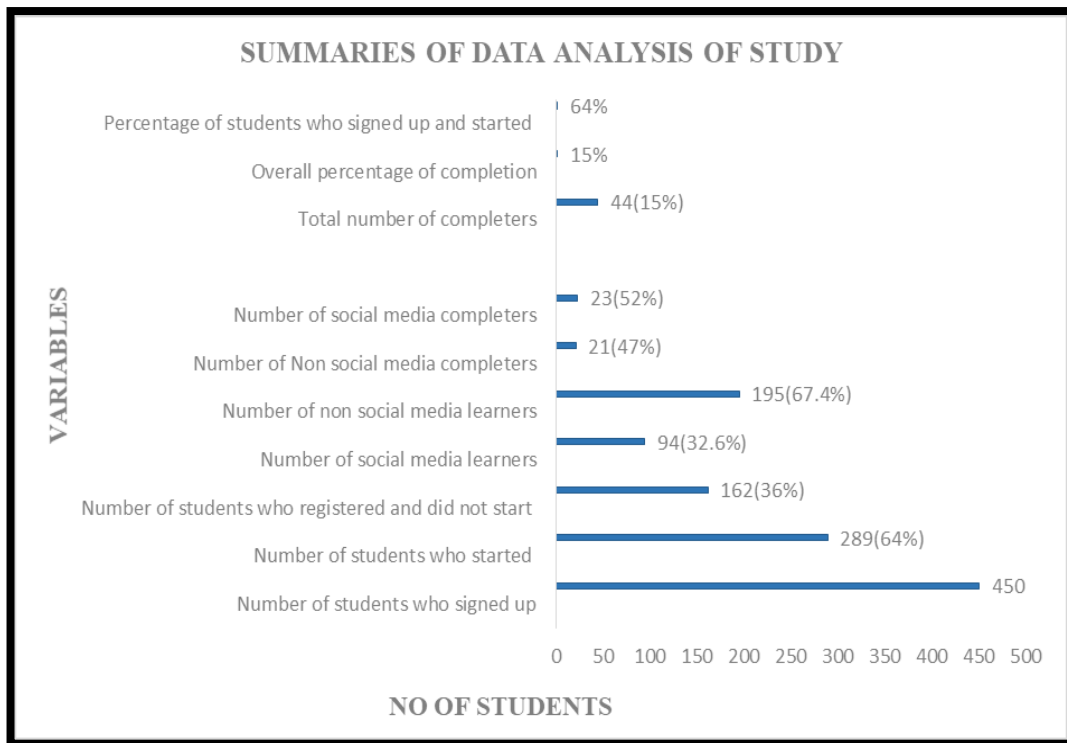


Figure 6.1 Data summaries from MOOC

6.4 SOCIAL MEDIA DATA

Figure (6.2) shows that 44 (46.8%) were engaged in Facebook, 41 (43.6%) WhatsApp and 9 (9.6%) google.

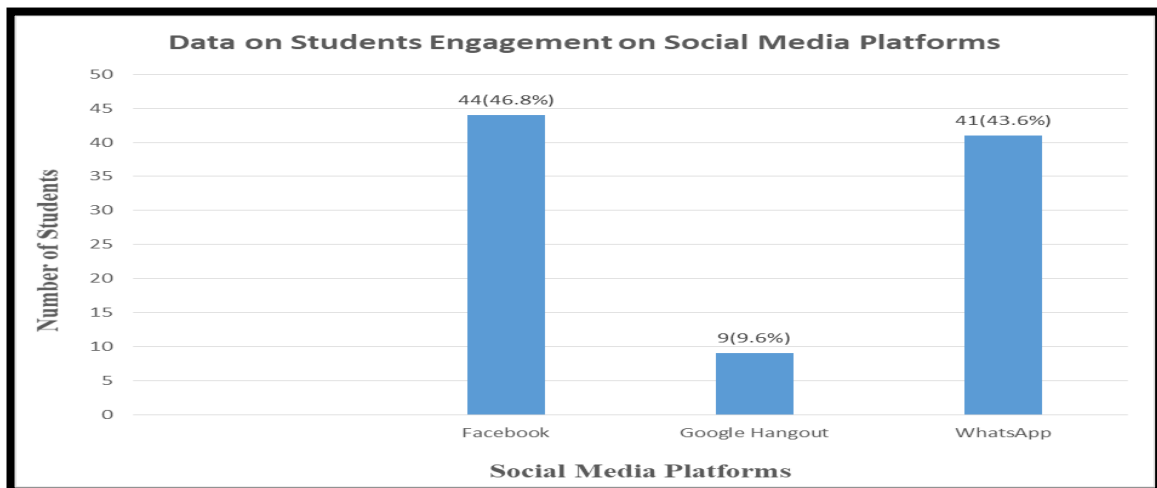


Figure 6.2 Data showing social media engagement

CHAPTER SIX - Analysis of Experimental Studies

There were three questionnaires in all for the MOOC course. The welcome, motivation and exit questionnaires. Responses from these surveys were extracted and are listed below.

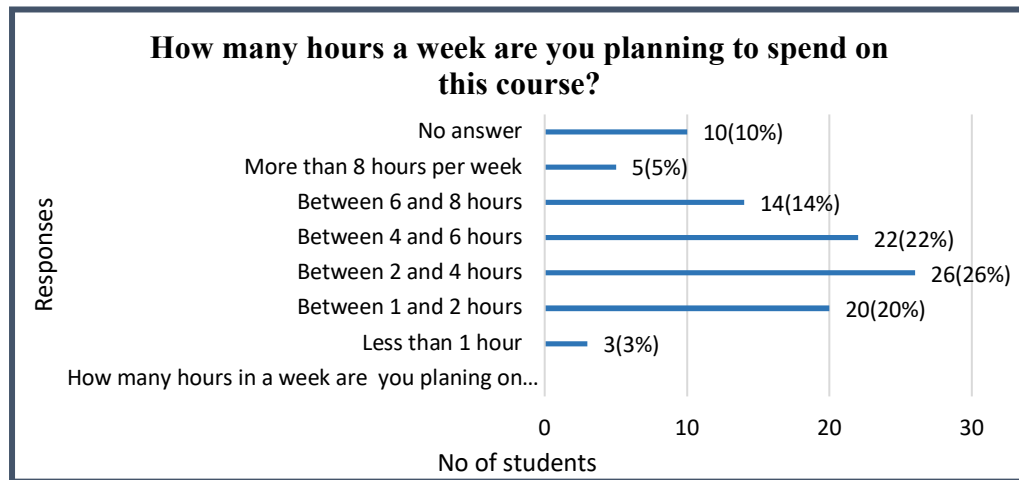


Figure 6.3 Responses on the course plan

The above responses in fig 6:3 show the hours the students planned to spend. 26% planned to spend 2-4 hrs, 22% 4-6hrs, 20% 1-2hrs, 14% 6-8hrs, 10% no answer, 5% 8hrs and 3% less than an hour. These data would be referred to in the discussions section when concluding course engagement (time spent) to the overall activity volume (time spent) on the course.

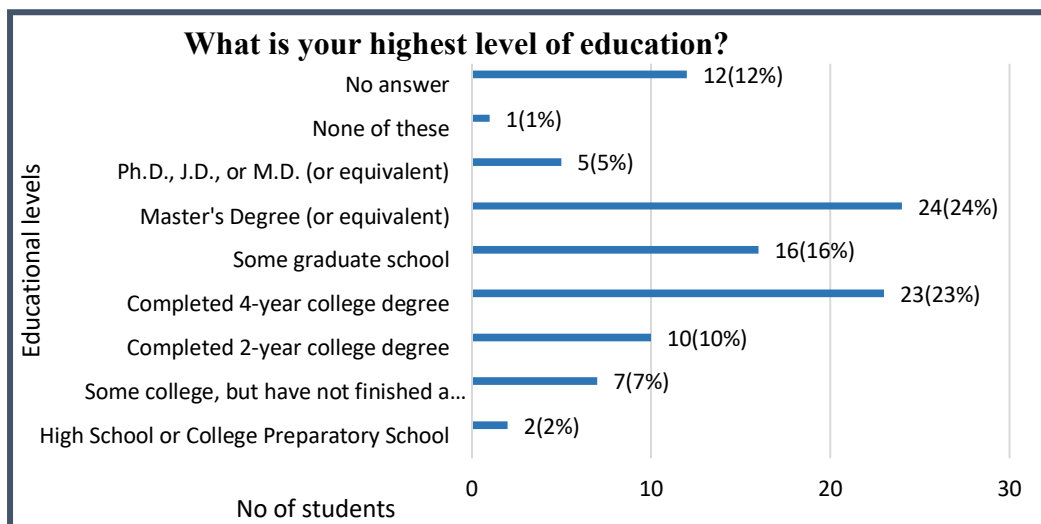


Figure 6.4 Educational levels of MOOC students

The above responses in figure 6.4 shows the level of education 24% had master's degree, 23% a degree, 16% attended some form of graduate school, 10% completed 2-year degree, 5% PhD 2% high school while 1% had none of the listed qualifications and 12% did not respond.

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This gives an idea about the educational background of the learners. Other studies have shown that most MOOC learners are highly educated (Salmon, et al., 2015).

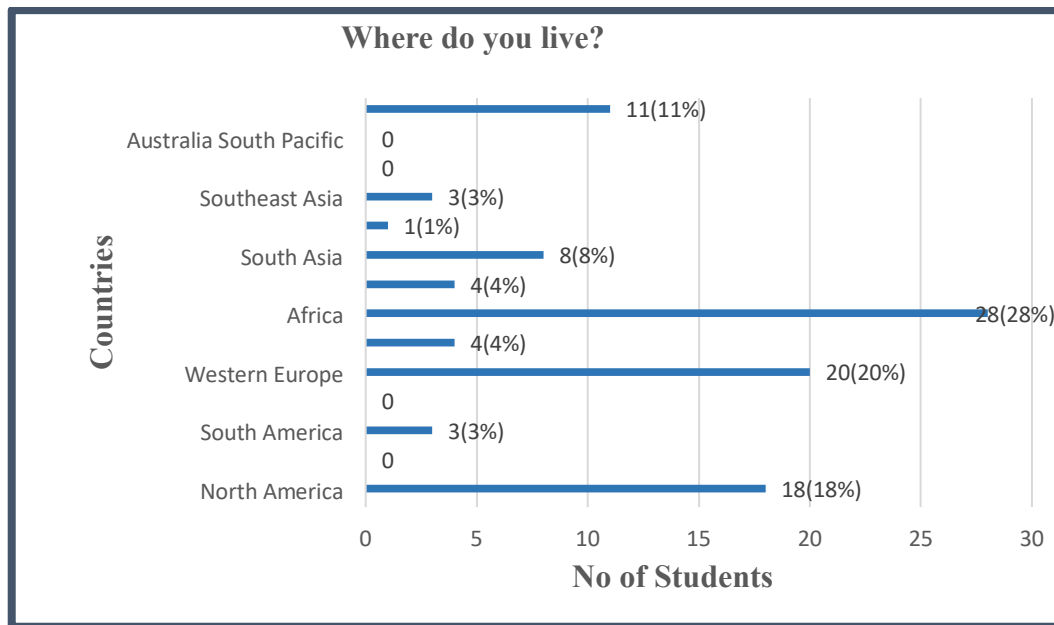


Figure 6:5 Geographical distribution

The above responses in figure 6.5 show the geographical distribution of respondents. 28% from Africa, 20% are from Western Europe, 18% North America, while the rest are from South Asia (8%), Middle East (4%), East Asia (1%), South East Asia, and South America (3%).

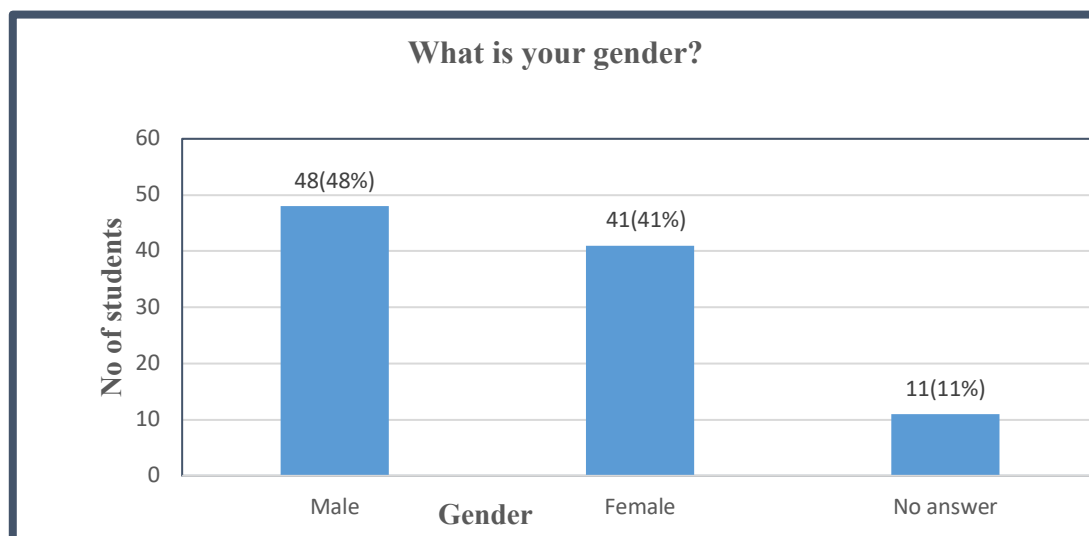


Figure 6.6 Gender distribution

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The above responses in figure 6:6 show the gender distribution of the respondents. 48% were male while 41%, female and 11(11%) no answer.

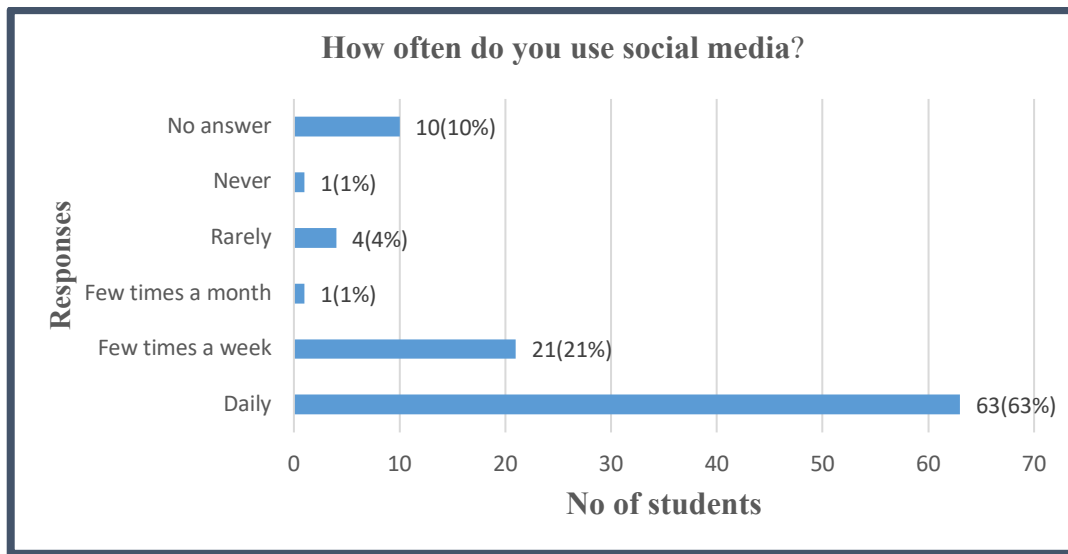


Figure 6:7 Responses on social media usage

The above responses in figure 6:7 show the responses to the use of social media. 63% indicated that they used social media daily. 21% a few times a week, 4% rarely, 1 % a few times a month and 1% never.

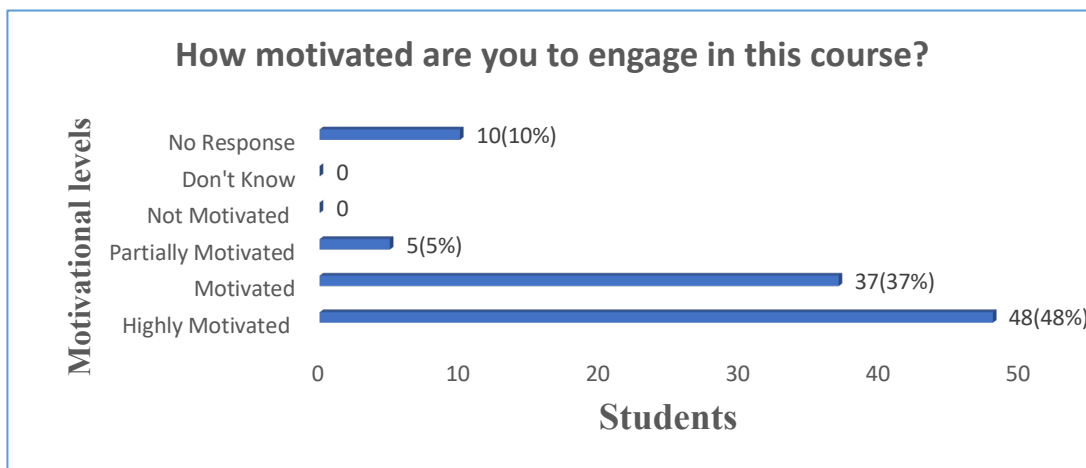


Figure 6.8 Responses on the motivation in engaging in the course

The above is the response (figure 6.8) on motivation on the course. 48 (48%) said they were highly motivated engaging in the course, 37 (37%) motivated, 5 (5%) partially motivated and 10 (10%) no response.

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6.4.1 Motivation Data

The motivation questionnaires were administered in the social media platforms through a link to Smart survey. Below are the responses from the survey. Only 51 responded to the questionnaire.

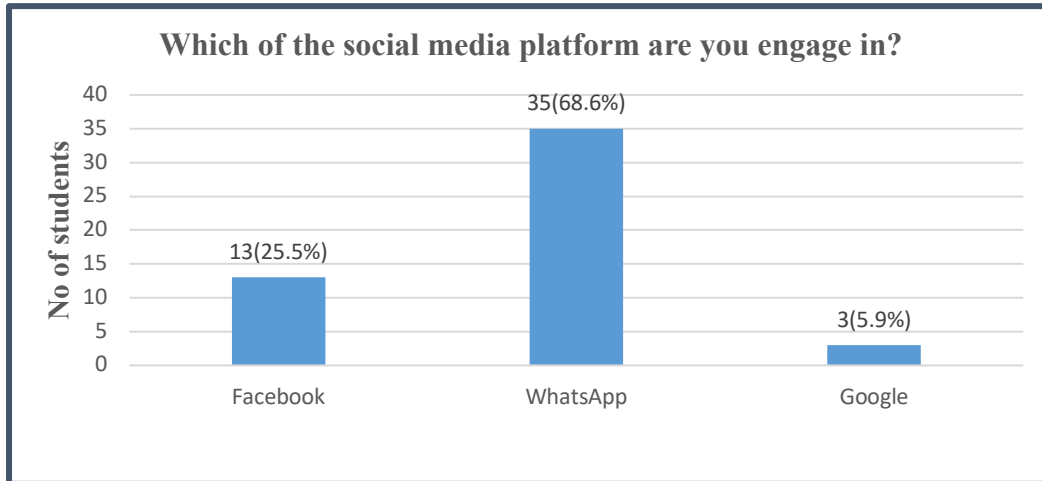


Figure 6.9 Responses on the social media engagement platform

The above responses in figure 6.9 show the number of students engaged in social media. 35(68.6%) engaged in WhatsApp, 13(25.5%) Facebook and Google hangout 3(5.9%).

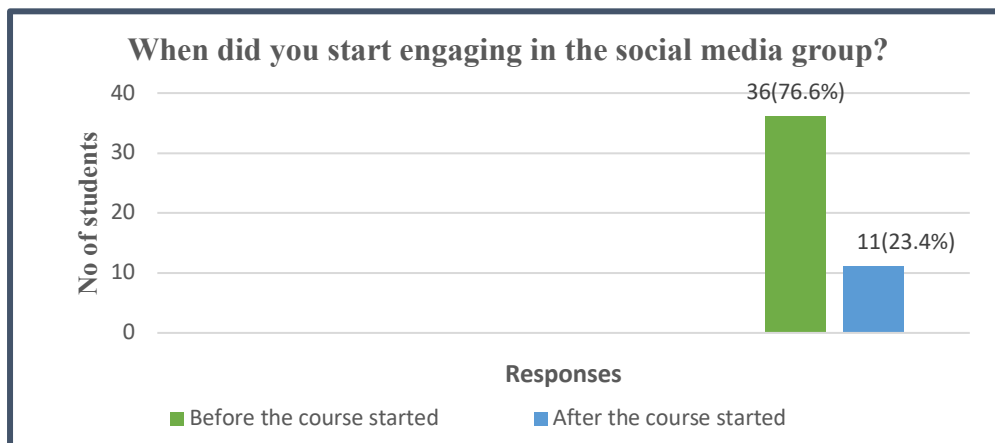


Figure 6.10 Responses On Period Of Engagement On Social Media

Fig 6:10 shows the responses on the period of engagement on social media. 36 (76.6%) engaged before the course started while 11 (23.4%) started after the course. Only 47 responded.

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6.5 Research Question

6.5.1 Objective 1:

To find out if early engagement in social media increases the number of students who start the MOOC from those who have registered.

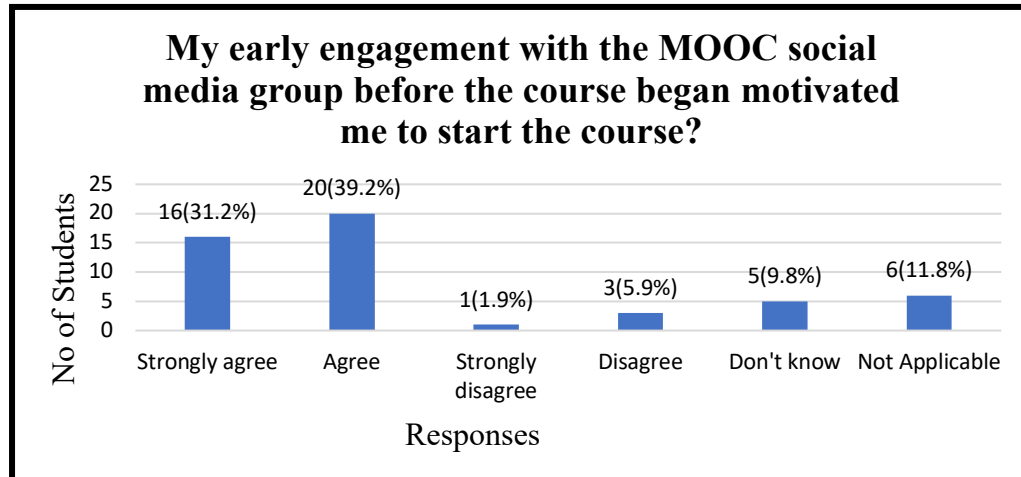


Figure 6.11 - Data on Motivation to start the course

Figure 6.11 shows the students responses regarding their motivation to start the course. From the questionnaire responses, 36 out of 45 students (80%), (51-6 i.e not applicable=45) strongly agreed and agreed that their early engagement on social media motivated them to join the course, 5 (9.8%) said they didn't know, 1 (5.9%) of students strongly disagreed, while in 6 (11.8%) said it did not apply to them because they joined the social media group after the course started.

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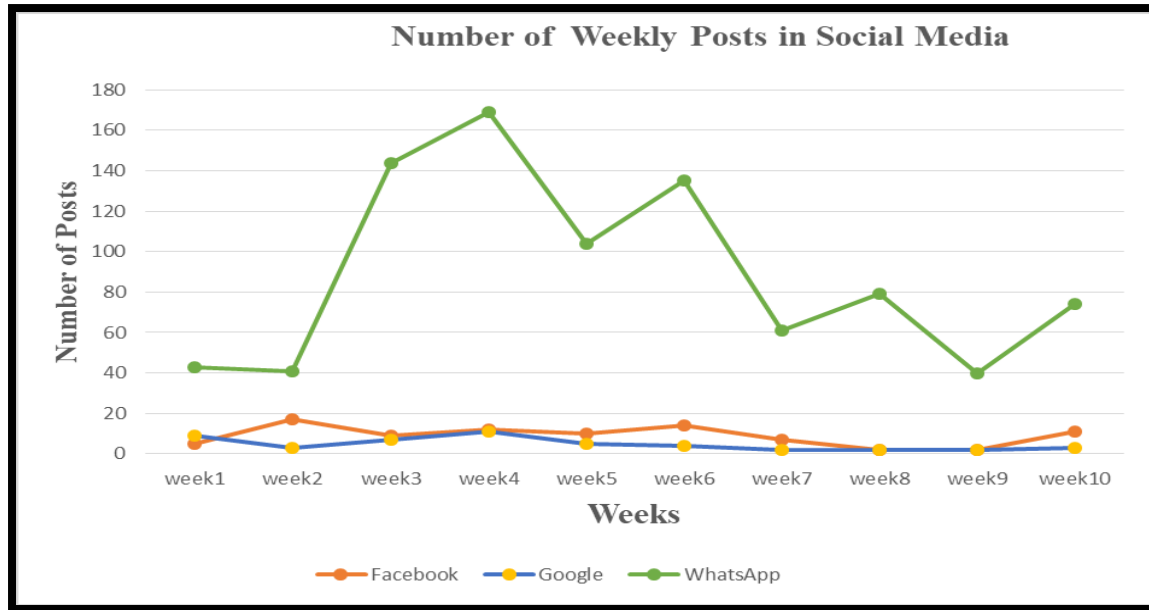


Figure 6.12: Data on weekly posts on Students Social Media platforms.

This is the weekly engagement on social media platforms for 10 weeks even though the course lasted 5 weeks and extended for 3 weeks. Students continued interactions for 2 weeks until all those who completed received their certificates before the platforms was closed.

The responses from the questionnaire shown in Figure 6.11 from those who engaged in social media were analysed to gather data to meet research objective 1. Only 51 students responded to the survey out of 94 students on social media.

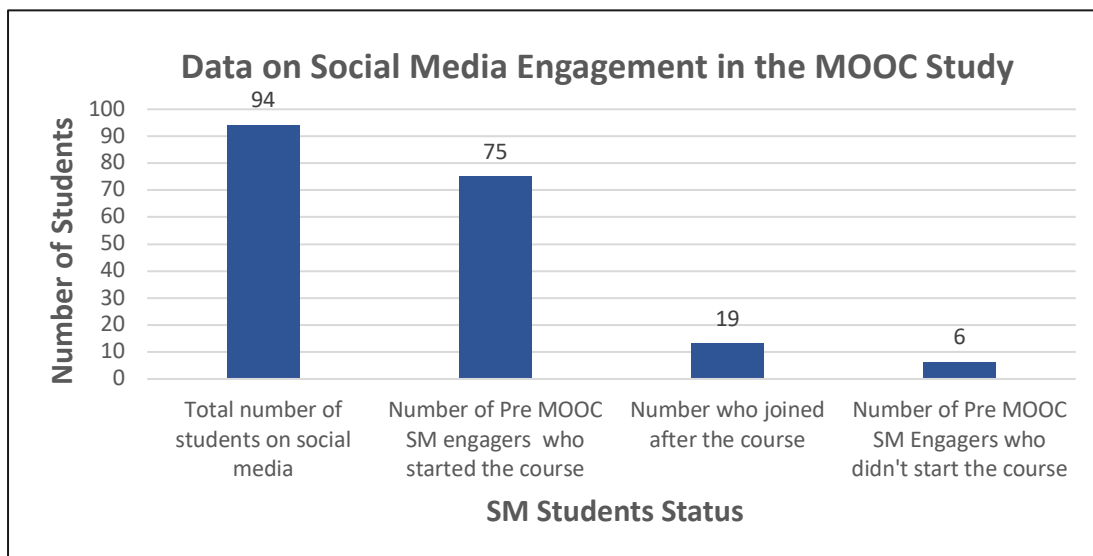


Figure 6.13: Data on Students Social Media Engagement in the MOOC

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To get a more detailed picture of students who engaged in the course social media before the MOOC, the number of students on social media who started the course was extracted.

Figure 6.13 shows total number of learners who engaged in social media before the course started. 75 (started the course); 6 (engaged on SM but did not start the course); 19 (joined after the course started); 195 (did not join social media). Therefore, the total number of SM learners before the course started was $(75+6=81)$. Total no. who started the course was $(81+195=276)$. Thus, (total number of learners on the course was $276 - 6$ (who did not start) $+19$ (who joined during course) $= 289$). Also, (Total number on social media during the course $=75$ (those who started the course) $+19$ (who joined SM and during course) $=94$). In addition, a calculation was done to find out the percentage of start up between those who sign up and engaged in social media, compared to those who did not. $\frac{75}{81} \times 100 = (92.5\%)$ (SM engagers). Non-social media starters (195) Therefore, the percentage of starters in NSM is; $\frac{195}{276} \times 100 = (70.7\%)$ (No Social Media). The results show that 92.5% of those who engaged in social media started the course while 70.7% who did not engage in social media started.

The findings of the study indicated that early engagement on social media could motivate learners to start the course. From the questionnaire responses, 36 out of 45 students (80%) strongly agreed and agreed that their early engagement on social media motivated them to start the course. Recalling the first Entrepreneurship and Innovation MOOC, which ran between May and July 2015, 1556 sign up to take the MOOC. Of those, 804 registered but never joined the course (51.7%) which in most MOOCs is typical (Bacon, et al., 2015; Onah, et al., 2014). In the second MOOC, 450 students sign up for the MOOC course. Out of this 289 (64%) started the course, 161 (35.8%) out of 450 did not start the course. It is typical that about 50% of those who register for MOOC do not start (Jordan, 2015). However in some studies more students who register may start a course but it is more typical in fee-paying courses where a potential student has more to lose if they don't engage (Koller, Ng and Chen, 2013; Xiong, et al., 2014).

Thus, overall 64% of those started the course which is higher than the typical figure for non-fee-paying courses of about 50%. On the other hand, this result may not be surprising because from the welcome survey (figure 6.7), out of 100 students who filled the questionnaire, 63% indicated that they use social media daily, 21% few times a week, 1% few times a month, 4% rarely.

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The qualitative results also support the quantitative data from some of the comments on the benefits of social media alongside the course.

- At least some expectations are set before the course
- Pre engagement might improve completion rates
- It creates momentum for the course enrolled
- It encourages group learning even before the actual course started

Therefore, to answer research question 1, from the result above; 92.5% of those who engaged in social media started the course compared to 70.7% who did not engage in social media started. In addition, additional data from figure 6.11 also shows that 36 (80%) of the 45 respondents who filled the questionnaire agreed and strongly agreed that early engagement on social media motivated them to start the course. This provides strong evidence that early engagement on social media could improve students' motivation to start the course.

6.5.2 Objective 2

To find out how motivated students are while engaging in social media interactions during the course.

In order to meet objective 2, data was extracted from the motivation questionnaire (Q2).

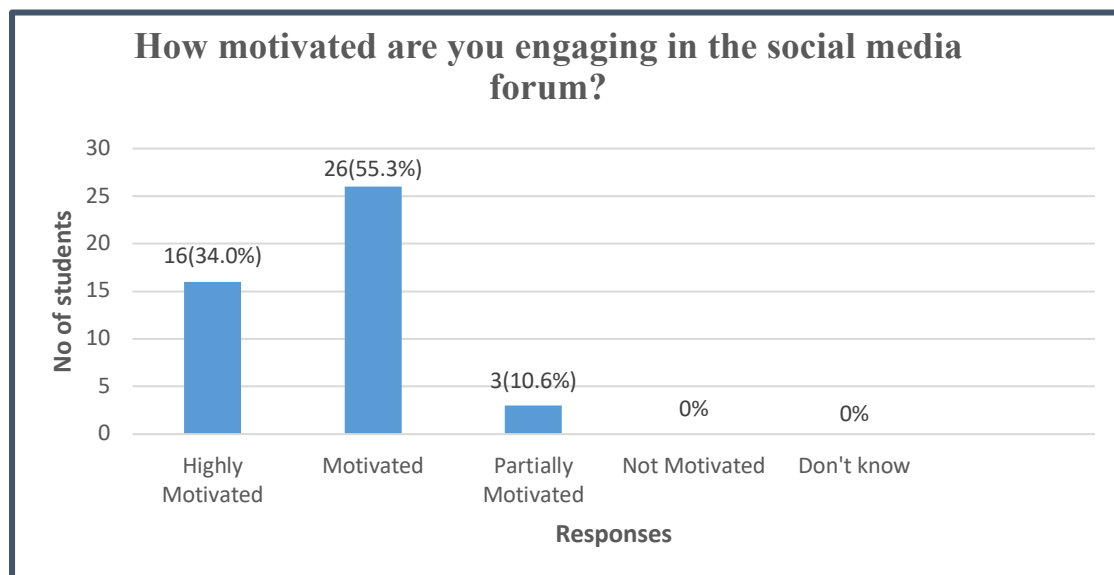


Figure 6.14 -Data on motivation to engage in social media

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Figure 6.14 shows students' responses on the motivation to engage on social media. 16 (34.0%) said they were highly motivated, 26 (55.3%) motivated and 3 (10.6%) were partially motivated.

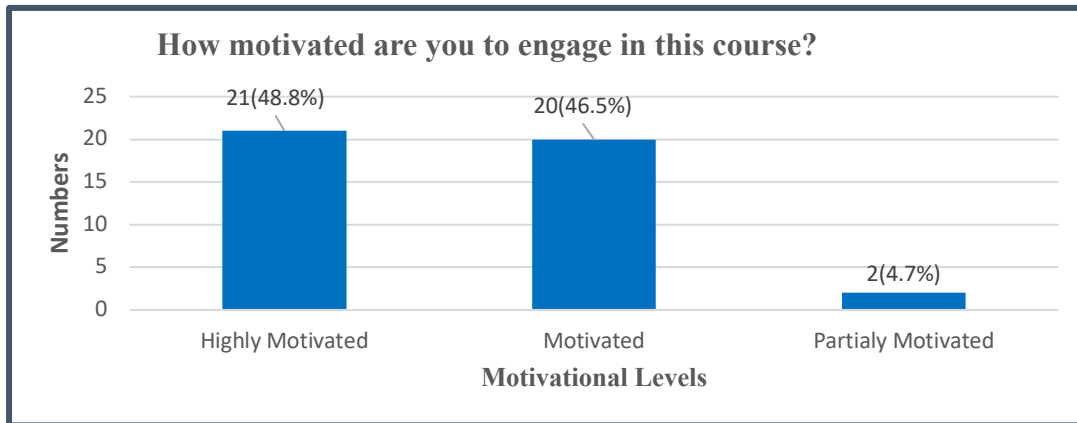


Figure 6.15 -Data on motivation levels

Figure 6.15 shows students' responses on the motivation on the course by social media engagers. 21 (48.8%) said they were highly motivated, 20 (46.5%) motivated and 2 (4.7%) were partially motivated.

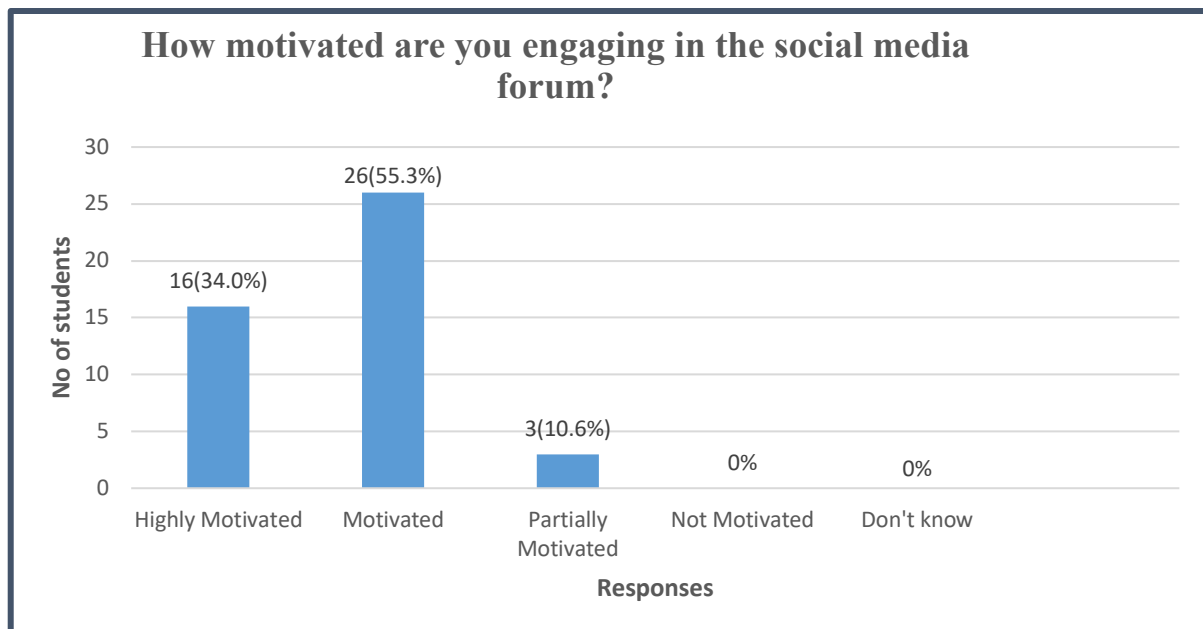


Figure 6.16 - Data on motivation engaging in social media.

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Figure 6.16 shows students' responses regarding their motivation to engage in the MOOC social media group.

Out of the 94 students who engaged in social media, 51 filled the motivation questionnaire on social media. Out of the 51 students, 16 (34%) said they were highly motivated; 26 (55%) motivated; 3 (10.6%) partially motivated. These results showed that the majority of students 45 (88.23%) were motivated to engage in social media platforms. No students indicated that they were not motivated or didn't know. The number of undecided students was 4 (7.84%). Besides, the responses of social media engagers on the course was extracted from the Welcome survey in the Canvas platform. Out of the 100 students who filled the form, 43 students were engaged in social media. ***Therefore, to meet objective 2, 45 (88.23%) of the 51 students agreed that they were motivated to engage in social media interactions.***

Besides, qualitative data confirm these results, as shown below from some of the comments below when students were asked to give benefits of engaging in social media alongside the course.

- *I think the instantaneous messaging (WhatsApp) keeps one updated much more frequently without having to open a browser to discuss issues. For me, it helps me squeeze time to read the discussions, which I may not have done if I had to fire up a browser. So, WhatsApp sort of prompts one to be involved. It is like a class bell. I think WhatsApp has kept me more engaged than I would have without it.*
- *Social media provides a relaxed atmosphere for learning*
- *The discussion also heightened expectations of the course*
- *Keeping myself motivated*
- *Motivated me to join the course*
- *I was well informed about what the course would benefit me, which further encouraged me to continue.*

Besides, the weekly engagement on social media shows that high participation, especially in the WhatsApp group, supports the qualitative data that the students were motivated. Wen, Yang and Rose, (2014) also used a weekly post to the measured level of motivation.

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From both the quantitative and qualitative results, it reveals that most of the students who were on social media were motivated. Therefore, we accept the alternative hypothesis which is “Learners who engaged in Social Media interactions during the course will be motivated”.

6.5.3 Objective 3

To find out if there is a correlation between intentions (motivational factors) of social media participants and completion.

To meet the research objective 3, data on social media learners was extracted from the welcome survey on the question “*Not everyone has the same participation and learning goals. We welcome the diversity, which type of online learner best describes you?*” 51 students on social media filled the welcome survey questionnaire. Learners had 4 options to choose from. There were four responses describing the learner “An observer, Active participants, Passive and Drop-in”. The responses were assigned numerically from 4 -1. Active participants intending to complete is “4”, Passive participants “3”, an observer “2”, and Drop-in “1”. Besides, learner status of completion was obtained from the canvas dashboard. Those who completed were assigned value of “4” and not completed “1”. The data was input into SPSS and a correlation analysis was carried out using Spearman coefficient correlation analysis, in order to determine the relationship between intentions and completions. Spearman coefficient correlation was used because it is a method, which can be used to measure the strength and direction (negative or positive) of an association between two variables.

The result will always be between 1 and minus 1 as explained in chapter 4 table. Table 6 & 7 shows the distribution of the motivational levels of the students with the completion rate. The results show that there is no positive correlation between motivational intentions and completions, which is shown in Table 8 and Fig 6:18, which shows scatterplots (no relationship). The spearman coefficient correlation is $r_s=0.009$ and not statistically significant ($P<0.949$) a 0.05 level at (2 tailed). Besides, the scatterplots confirm that there is no correlation between the 2 variables.

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Motivational levels (Intentions)

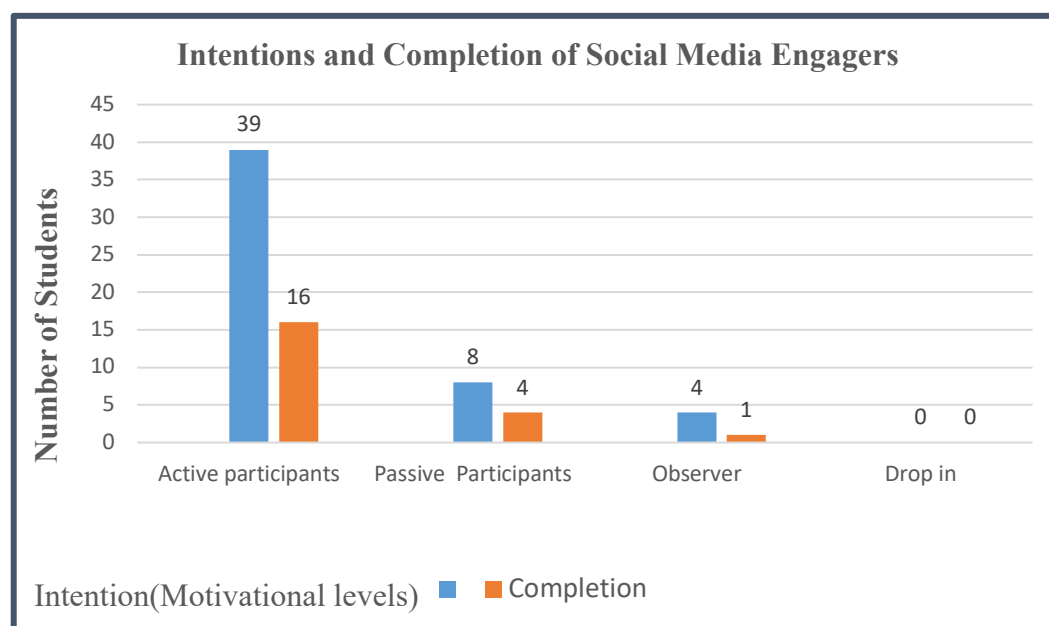
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Observer	4	7.8	7.8	7.8
Passive Participants	8	15.7	15.7	23.5
Active Participants	39	76.5	76.5	100.0
Total	51	100.0	100.0	

Table 6 Motivational Levels (intentions)

Completion

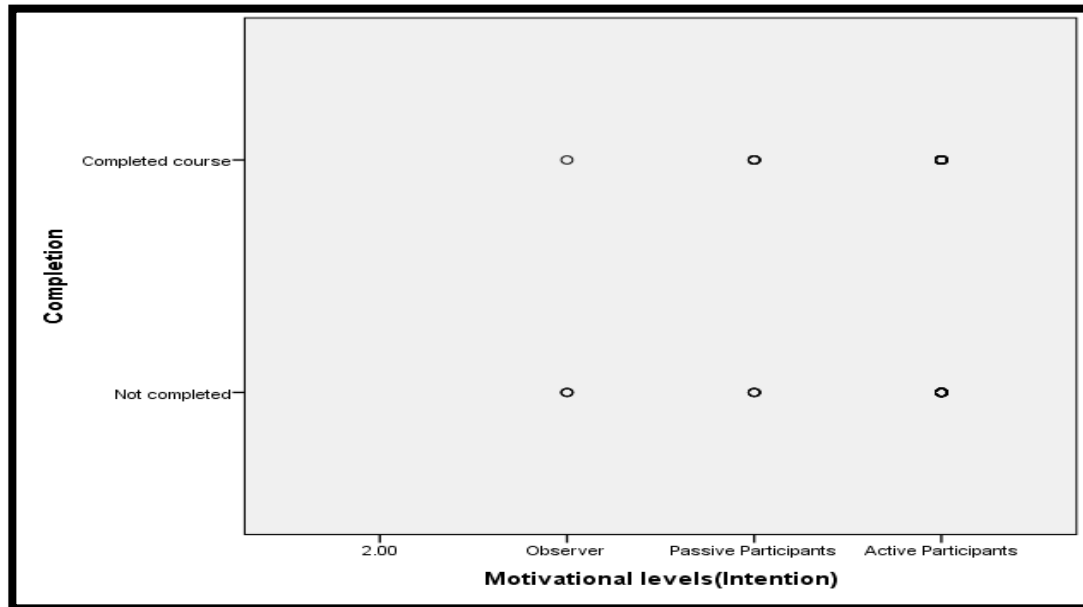
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Not completed	30	58.8	58.8	58.8
Completed course	21	41.2	41.2	100.0
Total	51	100.0	100.0	

Table 7 Frequency distribution for intentions and completion



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Figure 6.17 Intentions and completion of social media engagers



Correlations

			Motivational levels (Intention)	Completion
Spearman's rho	Motivational levels (Intention)	Correlation Coefficient	1.000	.009
		Sig. (2-tailed)	.	.949
		N	51	51
	Completion	Correlation Coefficient	.009	1.000
		Sig. (2-tailed)	.949	.
		N	51	51

Figure 6.18 Scatter plots for motivational intentions and completion

Table: 8 Spearman correlation for motivation and intention

This result means that the motivational intentions of students do not necessarily result in the completion or non-completion of the course.

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This is important because intention influences retention and it is important to evaluate the other factors that influence retention apart from social media engagement. According to Koller, Ng and Zhenghao (2013), for retention metrics to be useful, they must be define and interpreted with the learner's goals in mind.

Summary objective 3

To find out if there is a correlation between intentions (motivational factors) of social media participants and completion-The results show that there is no positive correlation between motivational intentions and completions. Therefore, we accept the null hypothesis. There is no relationship between the intentions of social media participants and completion.

6.5.4 Objective 4

To find out if there are significant mean differences in course engagement between MOOC learners who engage in Social Media and those who do not.

To meet this objective, the course engagement variable (participation, page view, activity volume and assignment) were considered separately for the two groups (SM & NSM). The first step was to extract the data from the Canvas dashboard. As described in the methodology chapter 3, the data on engagement was downloaded from the Canvas “*View Course Analytics Section*” of the platform. The data was downloaded in spreadsheet file format. Data on daily levels of participation of all the learners were calculated for the 57 days of the course. Each learner was marked according to 2 groups (Social Media & No Social Media). The “sort” tool in excel was used to separate the groups. The total number of “Participation “(number of threads i.e. posts and reply in course forum) per day for all the 57 days was obtained for each group and input into SPSS for analysis. The same procedure was used to obtain the other engagement variables “Page view” (number of pages clicked or viewed) and “Activity volume” (total time spent on course forum).

The next step was to ensure that the right method was used for statistical analysis. As the experimental structure is based on comparing 2 groups, participation in the MOOC course, a statistical hypothesis test was needed to evaluate the differences in participation in the 2 groups.

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Therefore, a procedure for carrying out either a t-test or a Mann Whitney U test (the non-parametric equivalent of paired t-test) was performed.

In order to carry out a test, it was necessary to find out whether the data fulfilled the conditions of a test, which are: 1. Data must be normally distributed. 2. It must not have outliers. 3. Randomly selected from a population.

Normality test for participation

This procedure involved carrying out a normality test in SPSS, which generates group statistics, normally a *histogram* with normal *quantile-quantile (Q-Q) plots and outliers*. Table 11 shows the test of normality Kolmogorov-Smirnov and Shapiro –Wilk test. Between these two results, the Shapiro Wilk test was chosen because the experimental data (N=57) is less than 2000 as recommended by (Leard, 2018). From table 11, the test of normality p-value (0.05) is < (0.014; 0.000). It is concluded that the data is not normally distributed.

Descriptive

		Statistic	Std. Error
Participation	Mean	19.8860	1.18317
	95% Confidence Interval for Mean	17.5419	
	Lower Bound		
	Upper Bound	22.2300	
	5% Trimmed Mean	18.8246	
	Median	18.5000	
	Variance	159.589	
	Std. Deviation	12.63284	
	Minimum	.00	
	Maximum	64.00	
	Range	64.00	
	Interquartile Range	15.00	
	Skewness	1.239	.226
	Kurtosis	2.245	.449

Table 9 Descriptive statistics for participation

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Tests of Normality

	Group	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<i>Participatio</i>	1	.085	57	.200*	.947	57	.014
<i>n</i>	2	.126	57	.025	.879	57	.000

*. This is a lower bound of the true significance.

Table 10: Test Of Normality For Participation

Q-Q Plots for participation

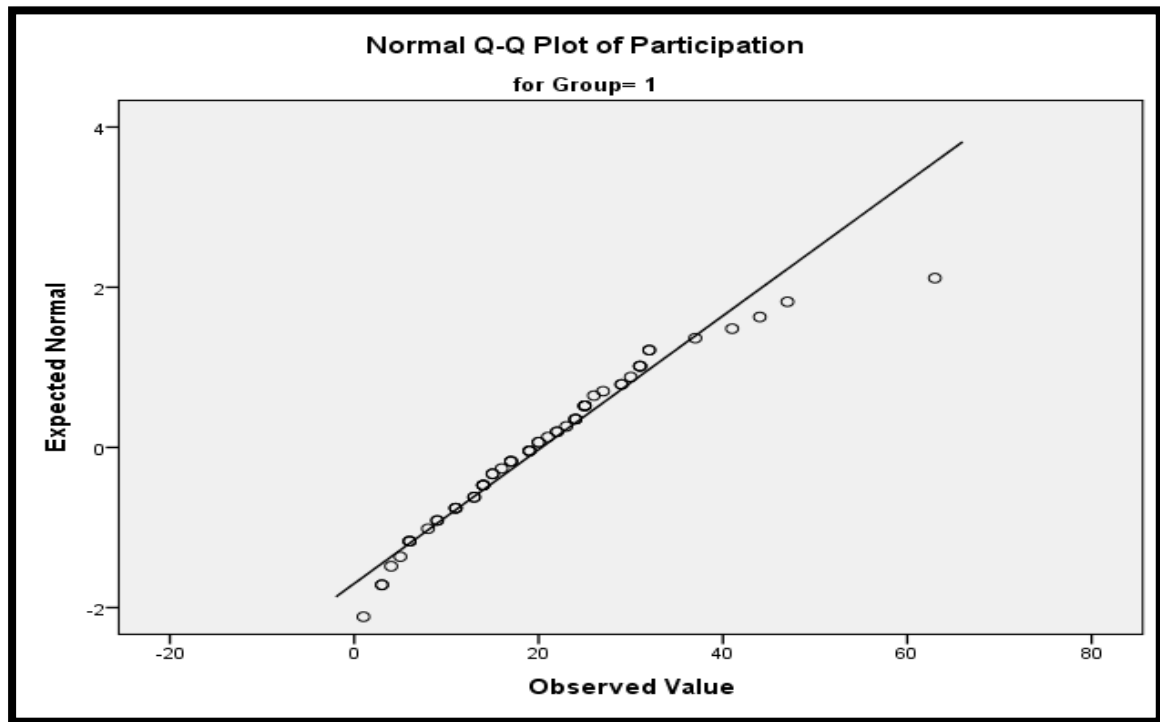


Figure 6.19: Q-Q Plots showing distribution of data captured on participation (Social Media group1)

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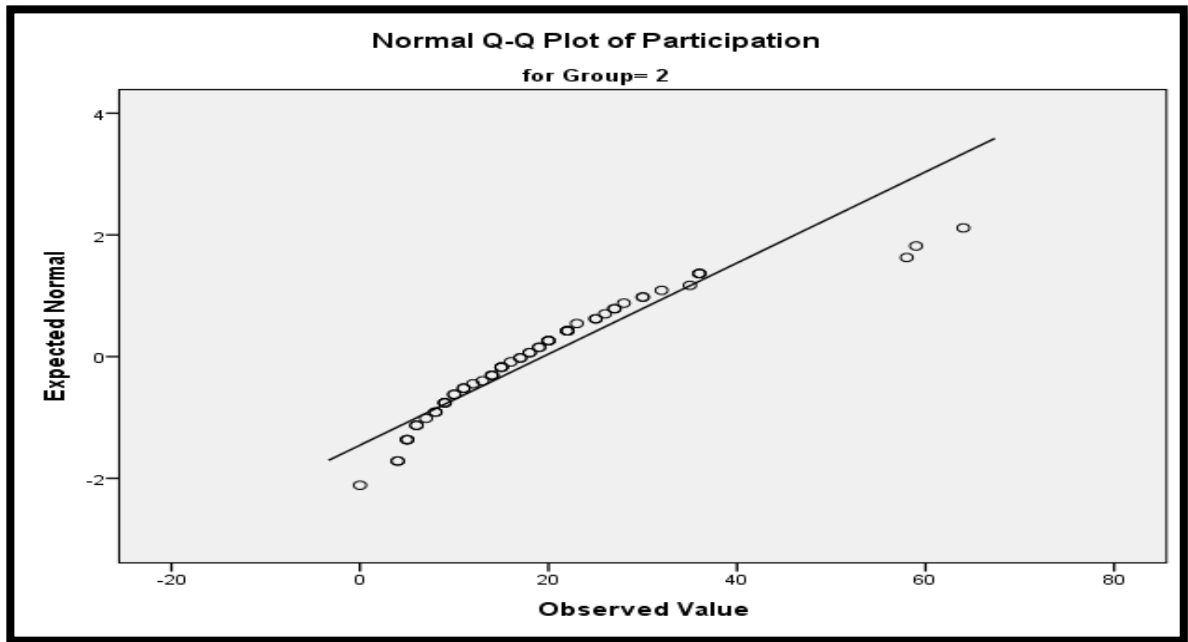


Figure 6.20: Q-Q Plots showing distribution of data captured on participation (No Social Media group2)

Figure 6.19 & 6.20 shows the Q-Q plot produced from the research data acquired for the fourth objective (course engagement-participation). The plot demonstrates that initially participation starts with other learners initially but then departs from the usual curve at the top. For the fact that only few of the participation data enfolded the linear line, the Q-Q plot offers strong indication that the data is not normally distributed.

Histogram for participation

The histograms from both group 1 & 2 in figure 6.21 & 6.22 participation shows that the data is more on the left and declines sharply on the right. The curve indicates that it is not like a bell shape, and more data are aligned to the left, which shows that the data is not normally distributed. In a picture-perfect distribution that is normal, the data distribution is precisely curve like a bell-shaped and half of the value are situated on the negative side and the remaining half on the positive side of the curve (Leard, 2018, Kazimoglu 2013).

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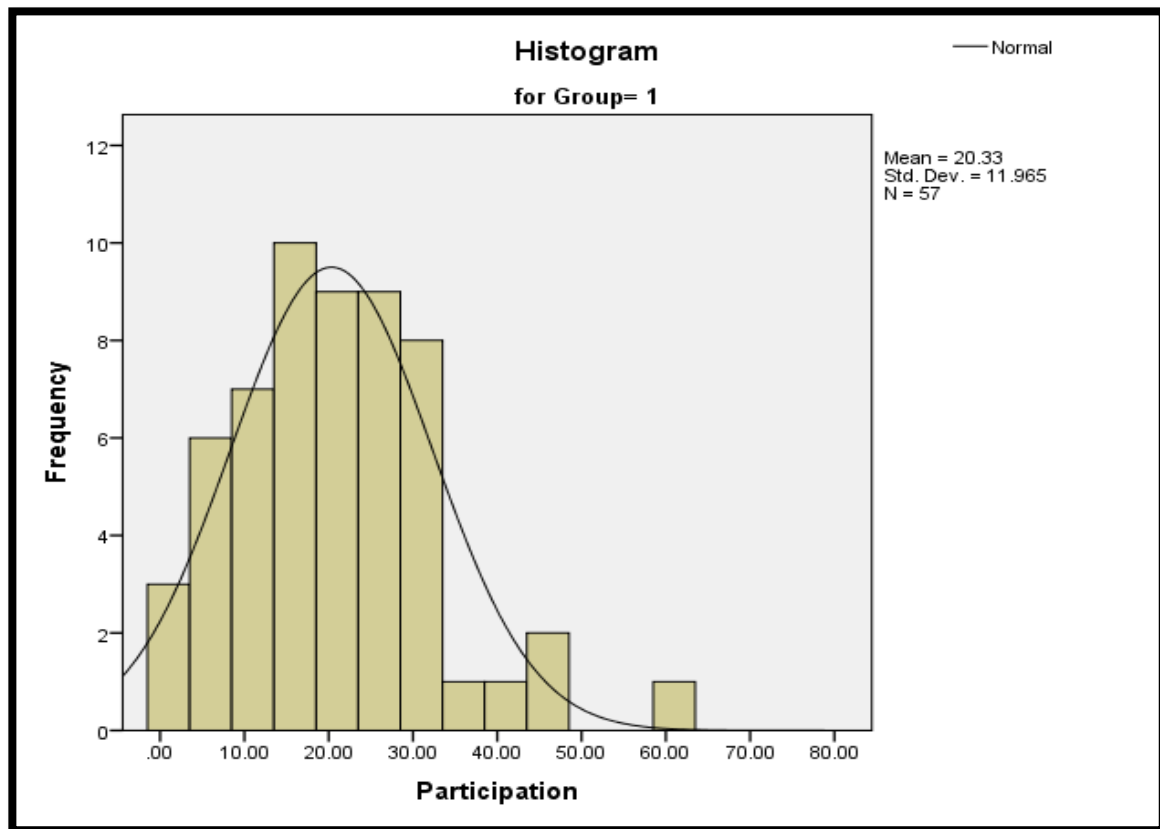


Figure 6.21: Histogram showing data distribution in participation in the social media group.

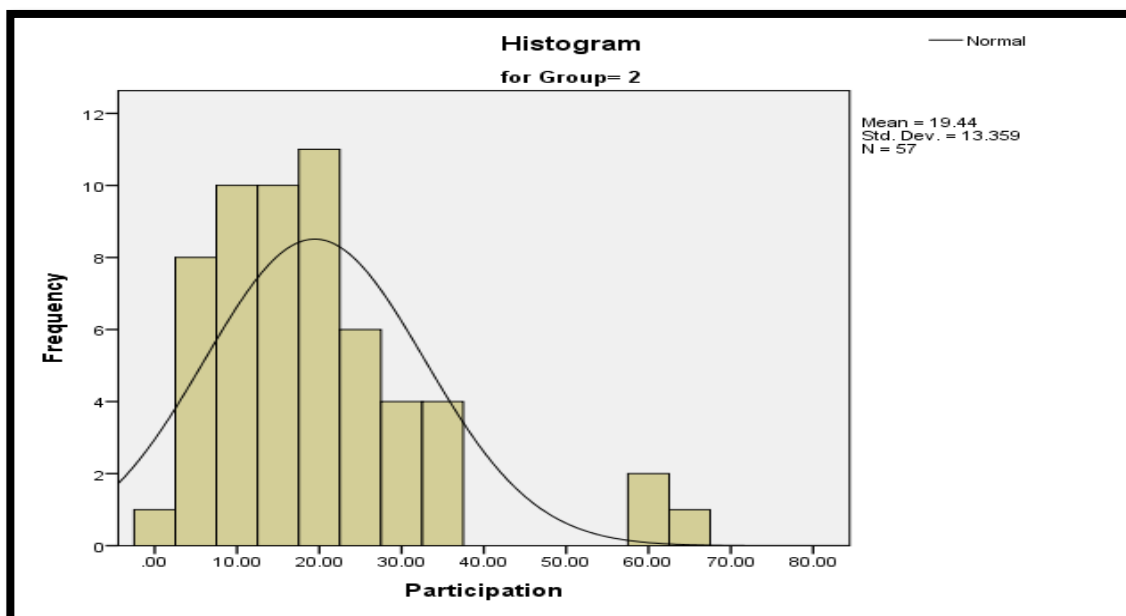


Figure 6.22. Histogram showing data distribution in participation in the non-social media group.

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Testing for Outliers for Participation

The next step is to test for outliers in the data using SPSS. The outlier is an observation that lies in an unusual distance from other values in the population sample (Leard, 2018).

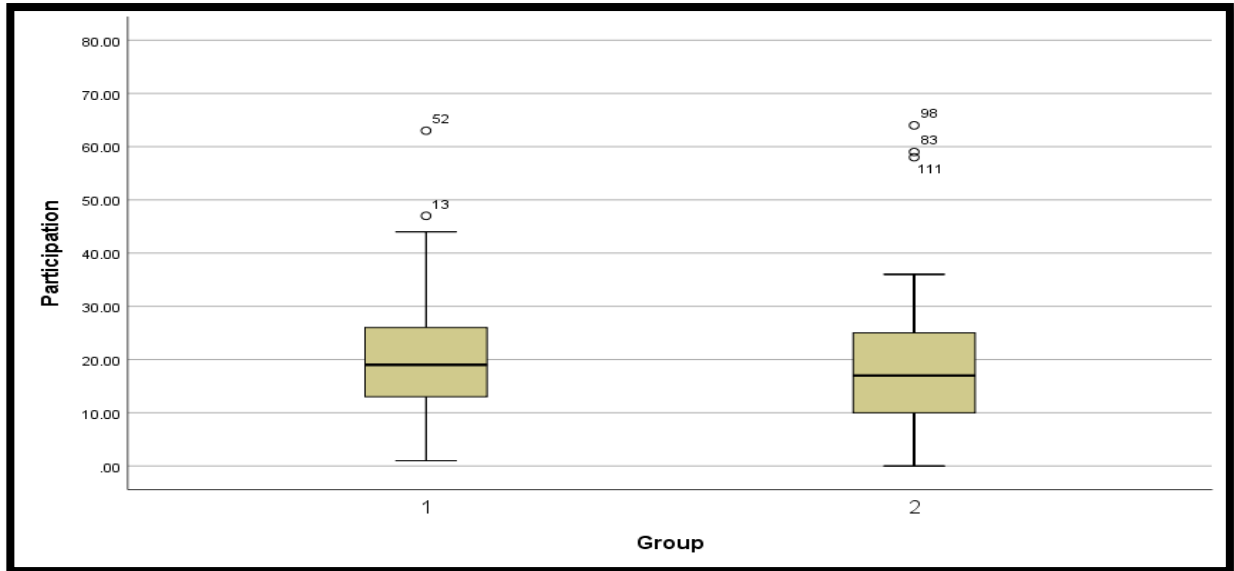


Figure 6.23 Box plot-showing outliers for participation

From the results, it shows that there are outlier values of 52 and 13 in-group 1; 111, 83 and 98 in group 2.

From the preceding test, it clearly shows that the data is not normally distributed; therefore, a non-parametric test (Mann–Whitney test) was used to test the mean differences in participation between the 2 groups (SM&NSM).

Test Statistics

	Participation
Mann-Whitney U	1491.000
Wilcoxon W	3144.000
Z	-.757
Asymp. Sig. (2-tailed)	.449

Table 11 Mann -Whitney U test for participation

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All the five applied methods for detecting a normal distribution (i.e. *Histogram, Quantile – Quantile plots, Skewness and Kurtosis normality check and Shapiro-Wilk test, outlier*) shows robust sign that the data for participation did not fit a normal distribution, therefore a Mann-Whitney test was carried out.

The results in the Mann-Whitney U test shows that there is no significant differences in the mean between social media and non-social media group for the participation variable. $P(0.449) > 0.05$. Therefore, we accept the null hypothesis.

Summary – Participation

From the result $P(0.449) > 0.05$, therefore, we retain the null hypothesis.

H₀ There is no significant mean differences in participation between learners who engaged in social media and those who do not.

H₁ There is a significant mean difference in participation between learners who engage in social media and those who do not.

Normality tests for page view, activity volume and retention follow the same procedure as in participation variable above.

PAGE VIEW

Page view refers to the number of pages materials viewed in the MOOC course during the 57 days of the course. The page view data is located in the “*View Course Analytics Section*” section. It is the total number of pages clicked by all the learners, which is shown by dates. (The data for page view was obtained as the same procedure as “participation” variable described in the “participation section”).

Statistics

		Group	Page View
N	Valid	114	114
	Missing	0	0
Std. Deviation		.50221	355.60276
Variance		.252	126453.320
Skewness		.000	2.595
Std. Error of Skewness		.226	.226
Kurtosis		-2.036	7.660
Std. Error of Kurtosis		.449	.449
Range		1.00	1913.00

Table 12 Descriptive statistics for page view

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Tests of Normality

	Group	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Page	1	.270	57	.000	.638	57	.000
View	2	.234	57	.000	.708	57	.000

Table 13 Test Of Normality For Page View

Histogram for Page View

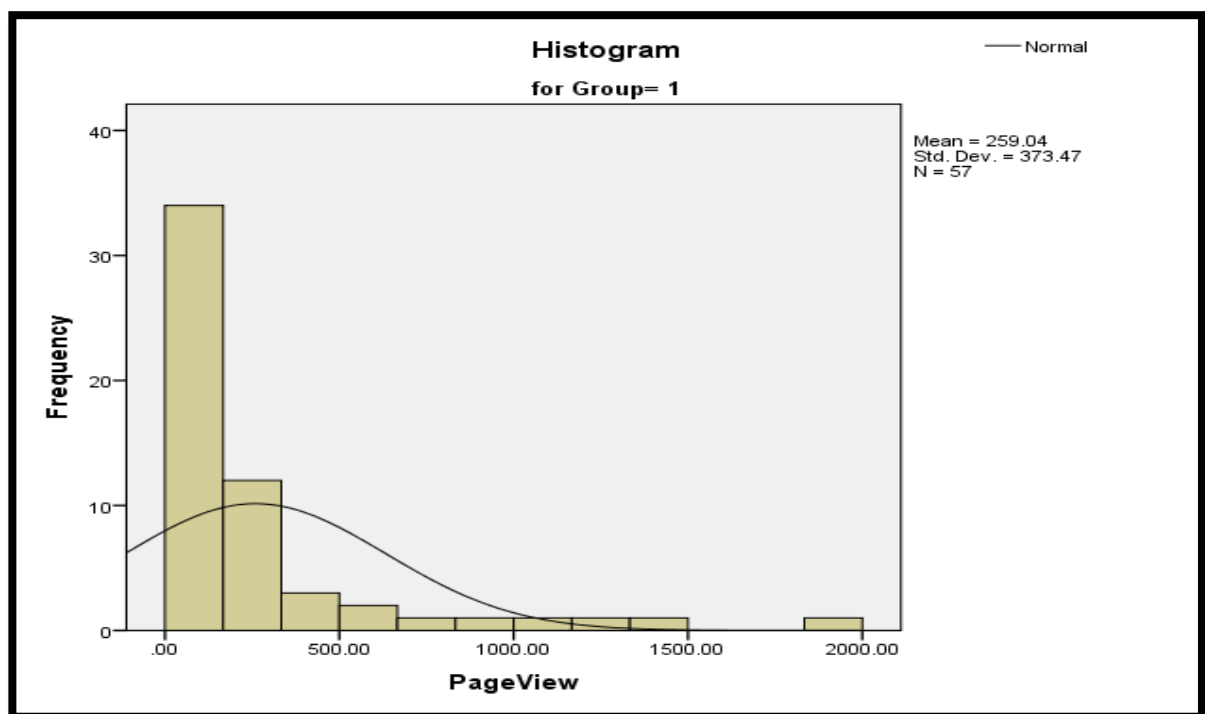


Figure 6.24– Histogram Showing Data Distribution On Page View For Social Media Group

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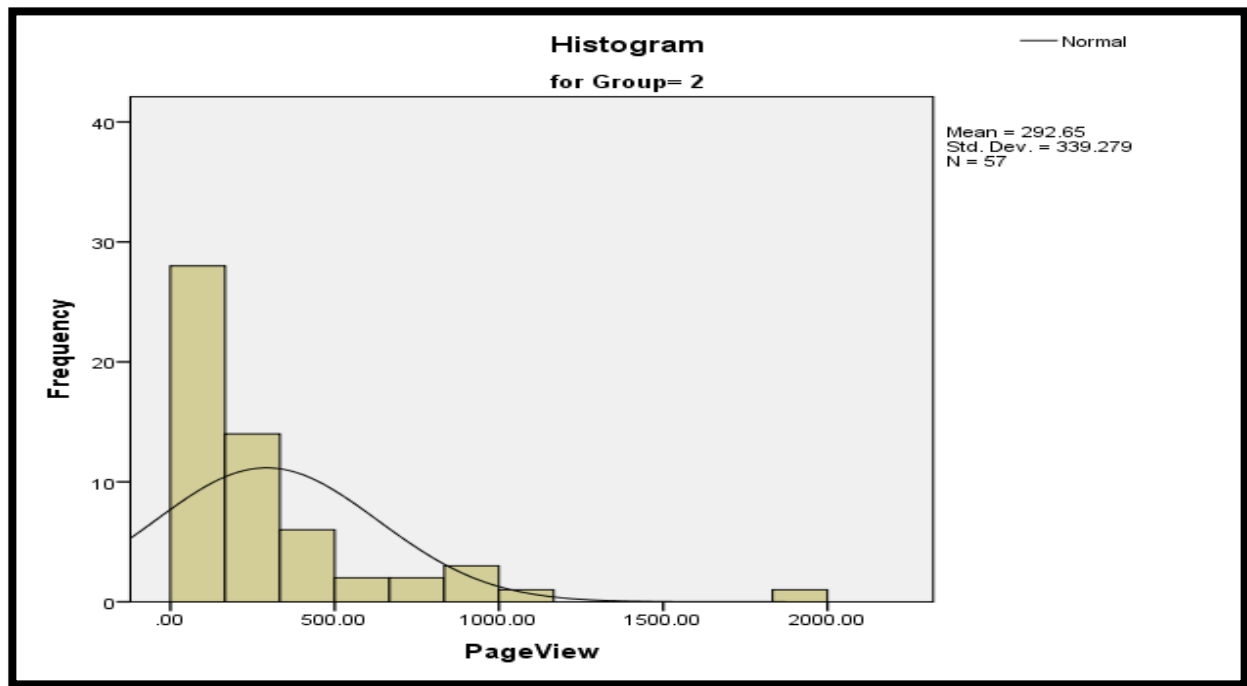


Figure 6.25 – Histogram Showing Data Distribution On Page View For Non-Social Media Group

The histograms from both groups 1&2 on page view show that the data is more on the left and declines. The curve indicates that it is not like a bell shape but slopes more to the right, which shows that the data is not normally distributed.

Q-Q Plots for page view

Both plots (Fig 6.26 & 6.27) shows that page view data did not begin with their normal initial counterparts, and clings to the line, and leave the normal curve at the top.

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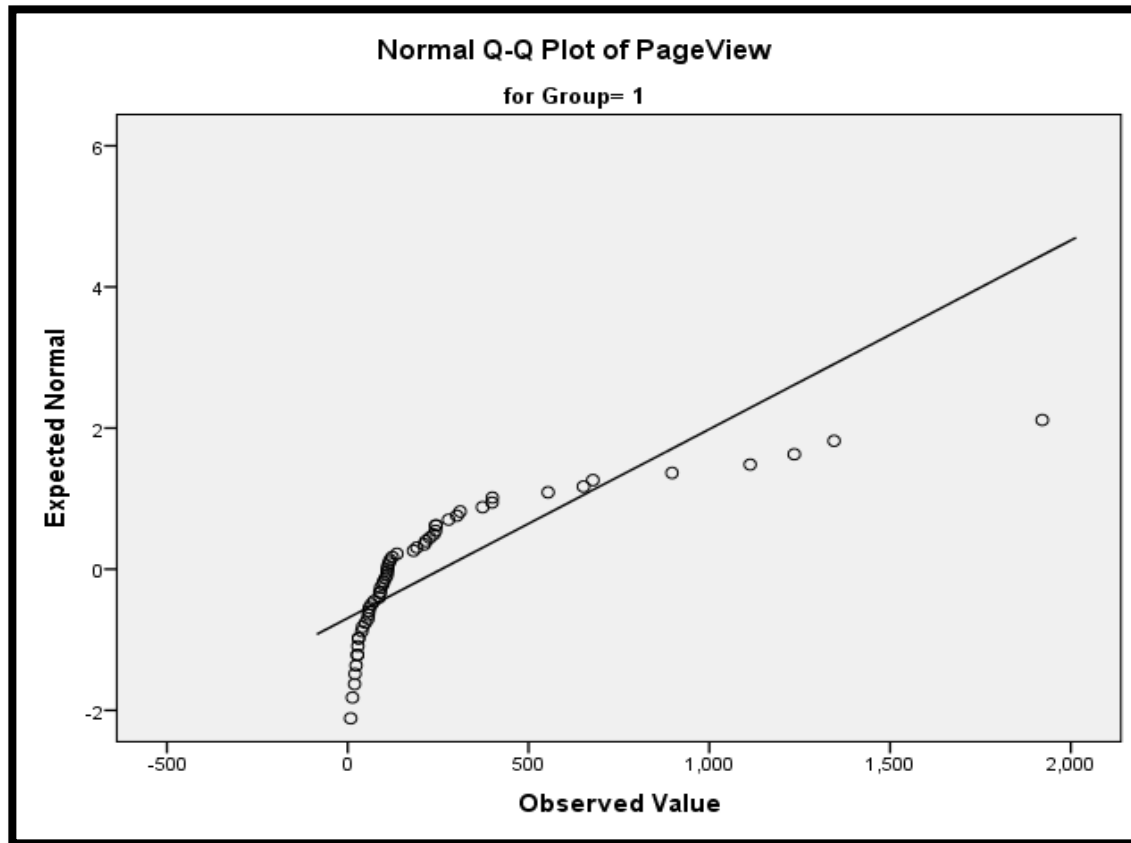


Figure 6.26 The Q-Q plot shows observations for Page view group 1(SM).

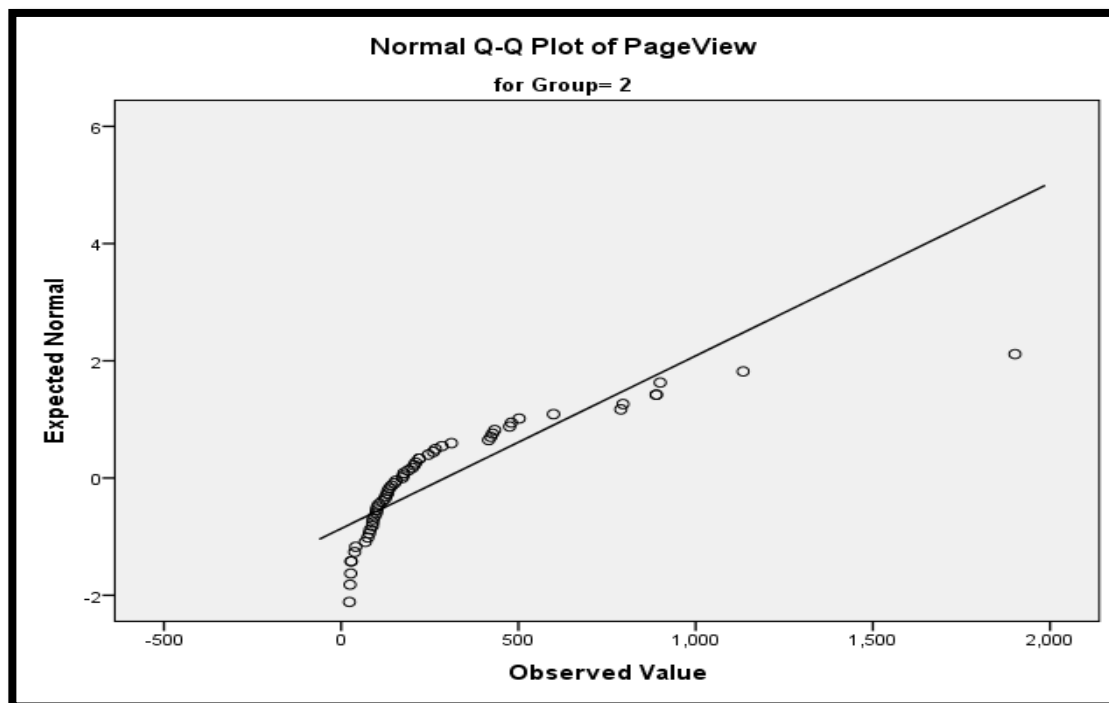


Figure 6.27 The Q-Q plot shows observations for Page view group 2(NSM).

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The Q-Q plot shows that the observations departed from the line and further away at the top with also confirms that the data is not normal.

The outlier for Page view.

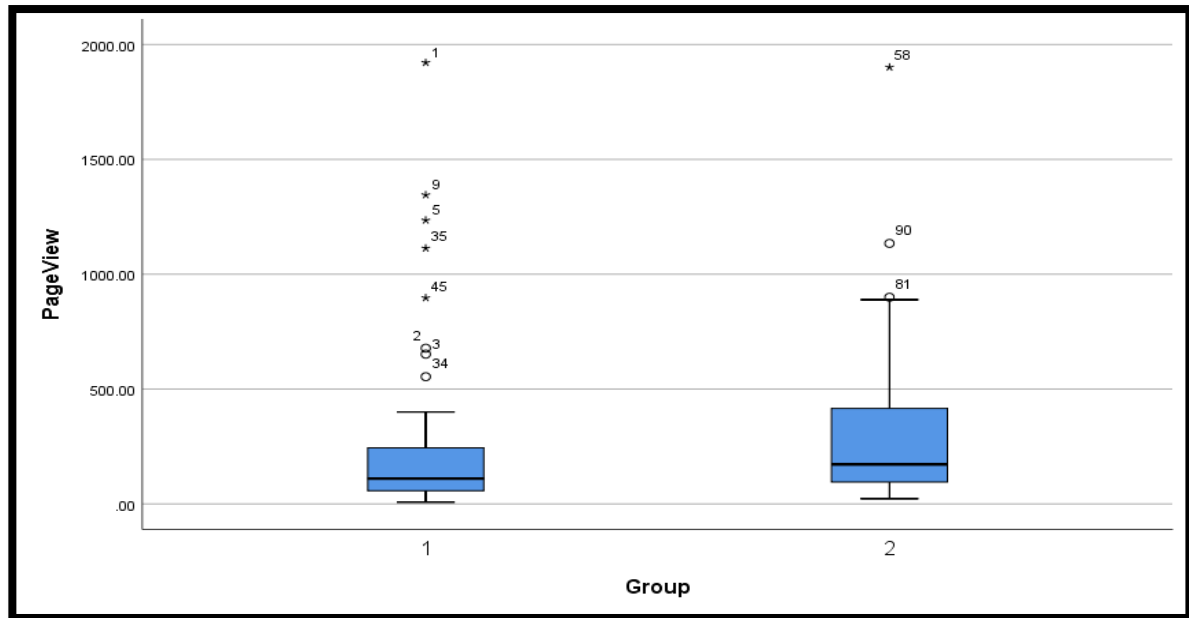


Figure 6.28 The box-plot is showing outliers for Page view in the 2 groups.

From the results, it shows that there are outlier values of 34, 45, 35, 5, 9, 1 in group 1 and in-group 2 at 81; 90.

Test Statistics

	PageView
Mann-Whitney U	1333.500
Wilcoxon W	2986.500
Z	-1.649
Asymp. Sig. (2-tailed)	.099

Table 14: Test statistics for page view

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All five approaches applied for a normal distribution identification (i.e. *Histogram*, *Quantile – Quantile plots*, *Skewness and Kurtosis normality check* and *Shapiro-Wilk test*, outlier) provides strong evidence that the data for page view did not fit a normal distribution. Therefore, a Mann-Whitney analysis was carried out.

Summary – (Page View)

A Mann-Whitney U test was conducted to identify whether or not the differences in the page view between social media and non-social media learners in the study is significant. As can be observed in Table 14, there is no significant difference in students' course engagement on page view. The p (0.99) value is > (greater than 0.05). Moreover, the findings provide evidence to support the alternative hypothesis, which indicates that there is no significant difference in the number of page views between the social media and non-social media group.

From the result, $P(0.099) > 0.05$; therefore, we accept the null hypothesis.

H₀ There is no significant mean difference in Page view between learners who engage on social media and those who do not.

H₁ There is a significant mean difference in Page view between learners who engage on social media and those who do not.

ACTIVITY VOLUME

Tests of Normality

	Group	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Activity	1	.270	94	.000	.661	94	.000
Volume	2	.304	195	.000	.552	195	.000

Table 15 Test Of Normality

Ranks

	Group	N	Mean Rank	Sum of Ranks
Activity Volume	1	94	159.76	15017.50
	2	195	137.88	26887.50
	Total	289		

Table 16: Descriptive Statistics For Activity Volume

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Activity volume is the amount of time spent on the course. Each period, the students spent on the course is shown in the “*View Course Analytics*” of the canvas dashboard. *It is important to note that when there is no activity for 3 minutes in the course platform, the system shuts down, and students have to login again.* It is calculated in hours, minutes and seconds. The amount of time was converted to minutes and seconds for each individual and imported into SPSS for analysis. The conversion was to make it easy to calculate in SPSS as a 2 decimal place was used. (The data for activity volume was obtained as the same procedure as “*participation*” variable described in the “*participation section*”).

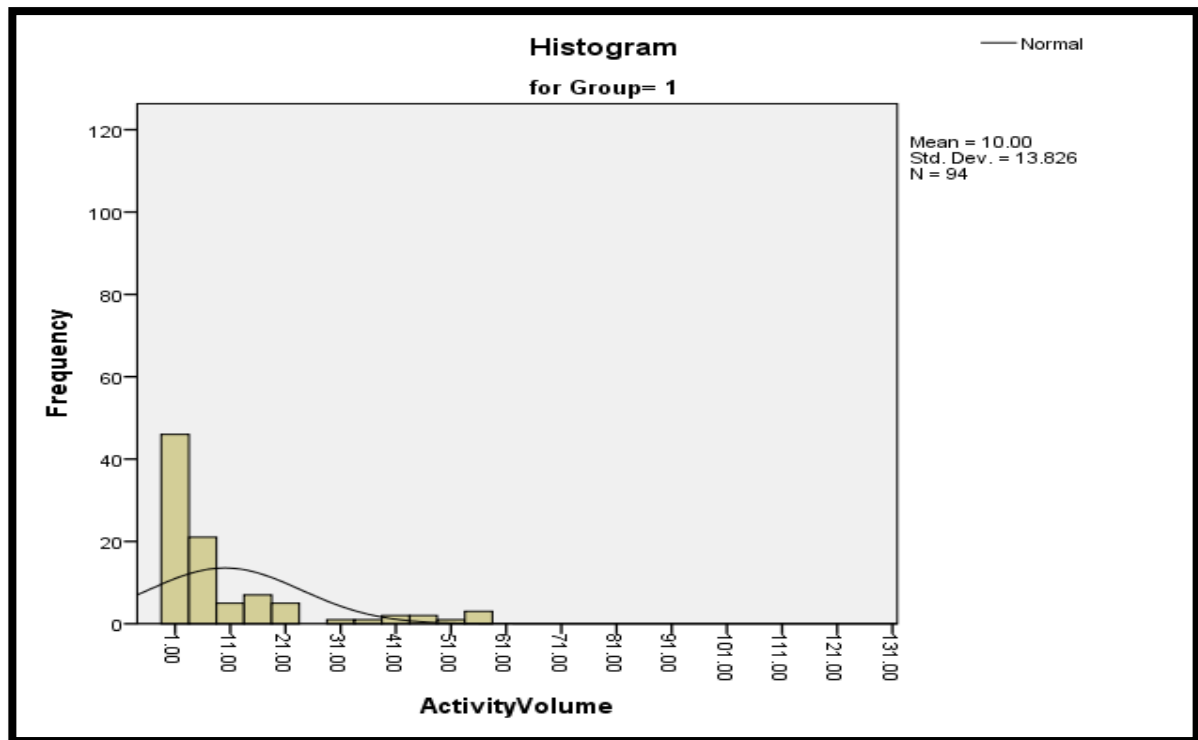


Figure 6.29 Histogram Showing Frequency Distribution For Activity Volume SM GP 1

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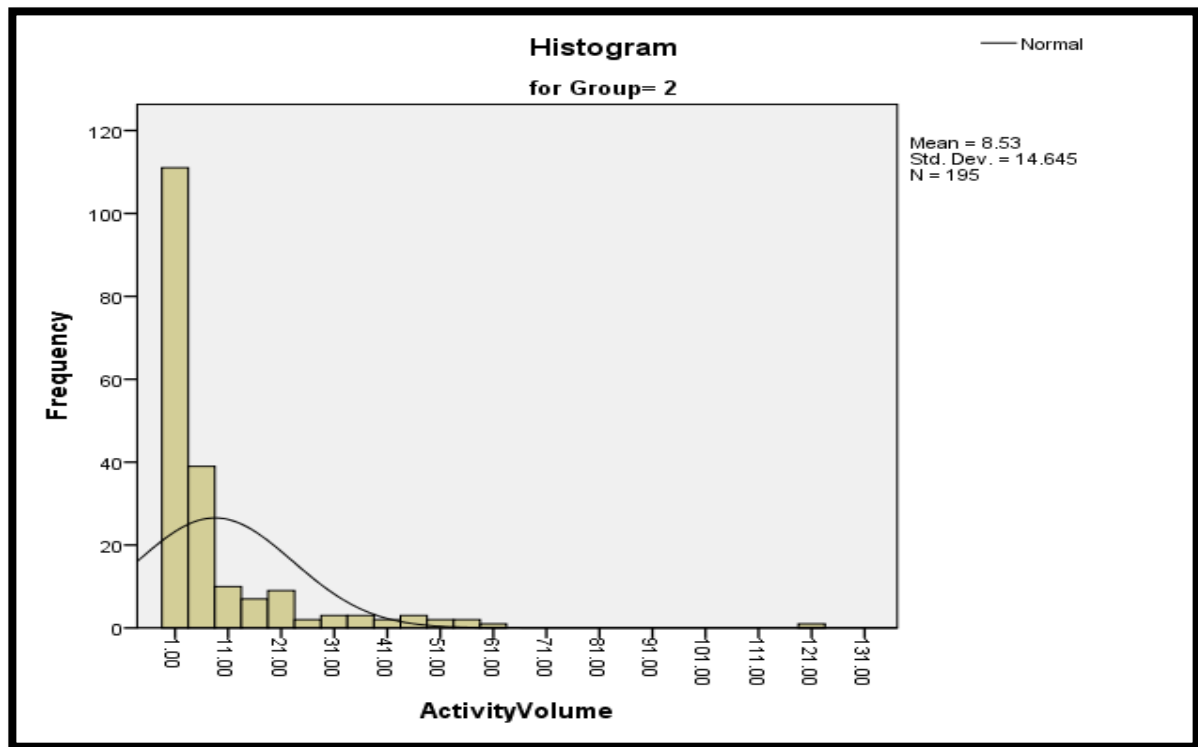


Figure 6.30: Histogram Showing Distribution Of Data On Group (2) (NSM) Group On Activity Volume.

The histograms from both groups 1&2 on activity volume show that the data is more on the left and declines. The curve indicates that it is not like a bell shape but tilted more to the left, which shows that the data is not normally distributed.

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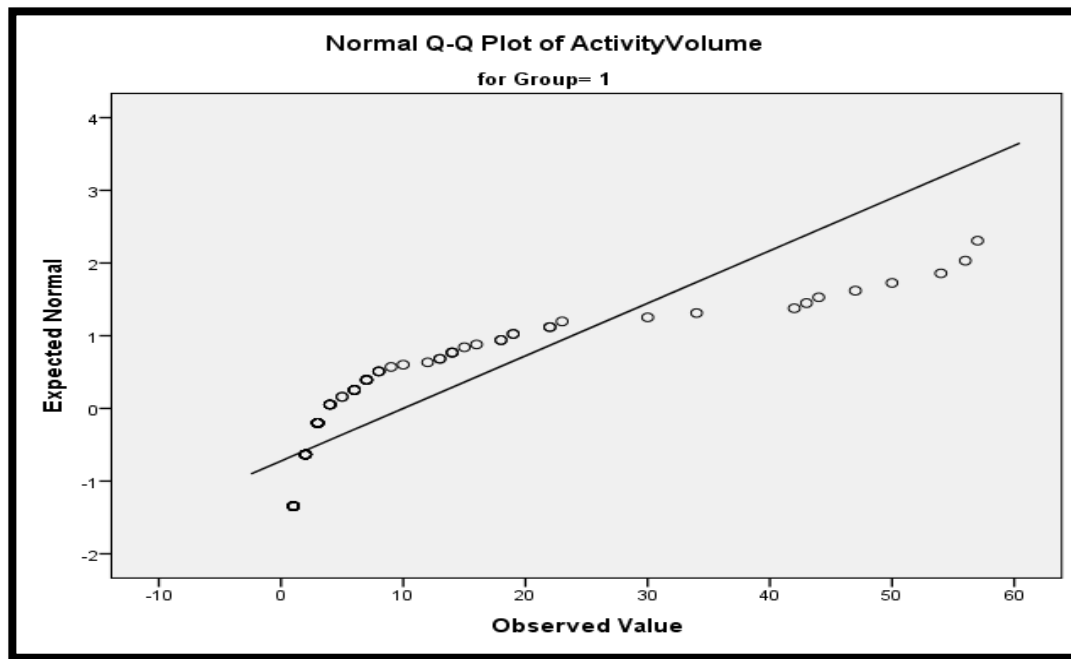


Figure 6.31 The Plot Shows Observations For Activity Volume For Group 1

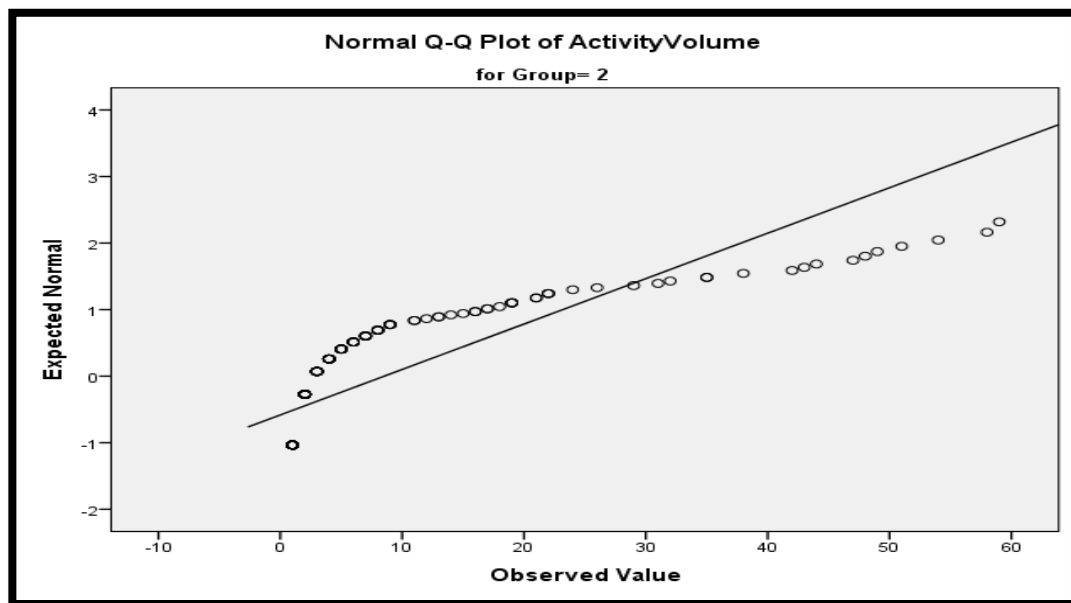


Figure 6.32 The Plot Shows Observations For Activity Volume For Group 2

The Q-Q plot in fig 6.31 & 6.32 did not cling to the line but falls outside the straight line showing that the data is not normal.

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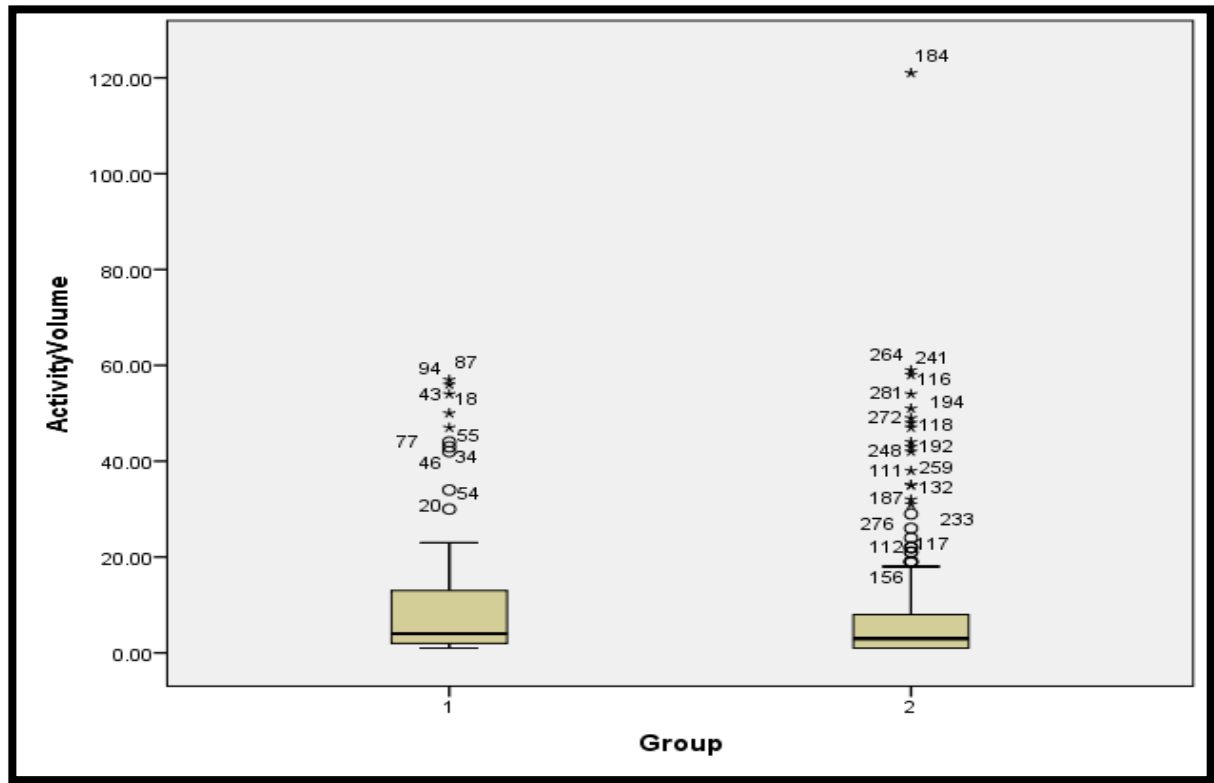


Figure 6.33. Box-Plot For Activity Volume

Boxplot for activity volume showing outliers, which further confirms that the data is not normally distributed.

	Activity Volume
Mann-Witney U	7777.500
Wilcoxon W	26887.500
Z	-2.111
Asym. Sig (2 tailed)	0.035

Table 17: Mann -Whitney test result for activity volume

All five methods applied for identifying a normal distribution (i.e. *Histogram*, *Quantile – Quantile plots*, *Skewness and Kurtosis normality check* and *Shapiro-Wilk test*, outlier) provided strong evidence that the data for activity volume did not fit a normal distribution, a Mann-Whitney test was carried out.

Summary – (Activity Volume)

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From the result, $P(0.035) < 0.05$; therefore, we reject the null hypothesis.

H_0 There is no significant mean difference in activity volume between learners who engage on Social Media and those who do not.

H_1 There is a significant mean difference in activity volume between learners who engage in Social Media and those who do not. (We accept the alternative hypothesis because from the result $P(0.035) < (0.05)$)

ASSIGNMENTS

One of the criteria for completing the course is submitting a business plan. The number of assignments submitted by all the learners was obtained from the “Business Model Sharing Forum” for both social media engagers and non-social media. The results are shown in figure 6.34. The mean for the assignment submission was obtained. Because there are no variances in the data, SPSS was not used for the data analysis.

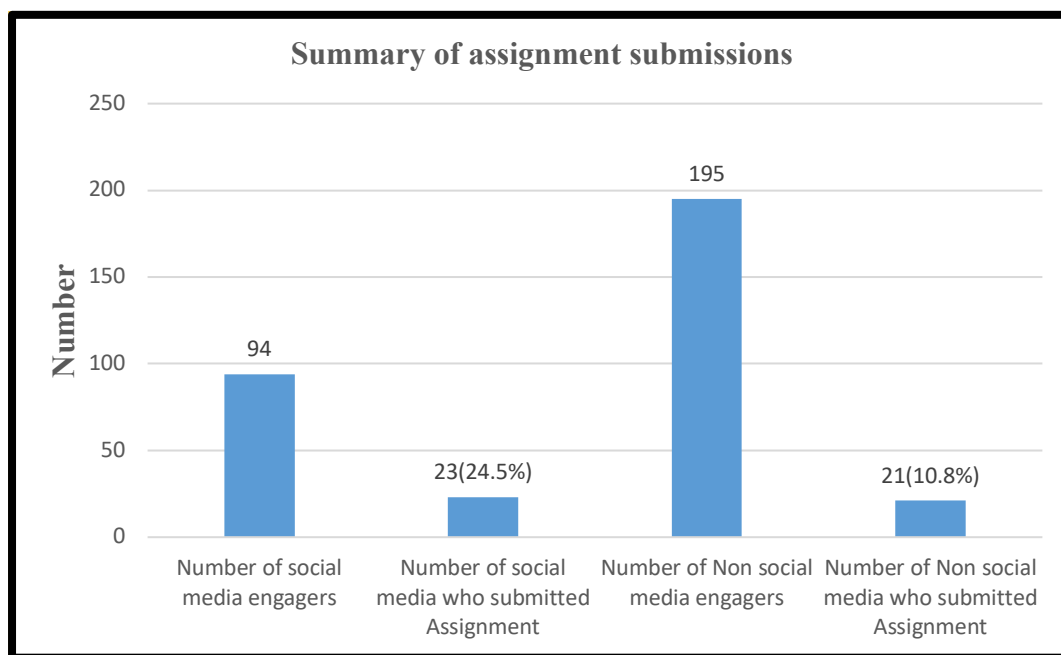


Figure 6.34. Assignment Submission

Mean for social media group = $94 \div 23 = 4.1$

Mean for non-social media group = $195 \div 21 = 9.3$

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Below is the summary of the hypothesis for the assignment. The data were not subjected to SPSS analysis because there was no variance. But simply by counting the number of learners who submitted.

Summary – (Assignment)

H₀ There is no mean difference in assignment submission between learners who engage on Social Media and those who did not.

H₁ There is mean the difference in assignment submission between learners who engage on Social Media and those who do not.

From the above data, it is clear that there is a difference between the means of the 2 groups. Therefore, we reject the null hypothesis. Despite the number of studies done to increase engagement in MOOCs, there is no empirical evidence that shows any studies that have compared the engagement rate (pageviews, assignment, activity volume and participation) between students who engaged in social media and those who did not. Therefore, the results from this study are of particular significance, as they show significant differences in the means of engagement variables like activity volume and assignments, which provides evidence that social media can influence learners' engagement in terms of the time they spend on the course. The variable participation and page views show no significant differences; this may not be surprising because the social media engagers had to participate in both the course forums. It is essential also to note that learners were encouraged to share their discussions on social media in the course forums, for other learners on the course forums to benefit. The benefit of the WhatsApp forum can be summarised through the comments of 2 learners.

“For me, it helps me squeeze time to read the discussions which I may not have done if I had to fire up a browser”.

“I think the instantaneous messaging (WhatsApp) keeps one updated much more frequently without having to open a browser to discuss issues”.

Zheng et al., (2016) also report this affirmation. They stated that current MOOC platforms do not include collaborative features to enable students to work together between both students, and students and teachers. Besides, Zheng et al., (2016) report that social media might provide another channel for interaction for the students.

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Also, Saadatmand and Kumpulainen, (2014) report that, for instance, one of the participants mentioned that when she does not understand something during the course, she asked other participants on Twitter for help. From the results, it is apparent that social media was the preferred methods of communication for the participants compared to the MOOC forum.

6.5.5: Course Engagement Data for Social Media Learners

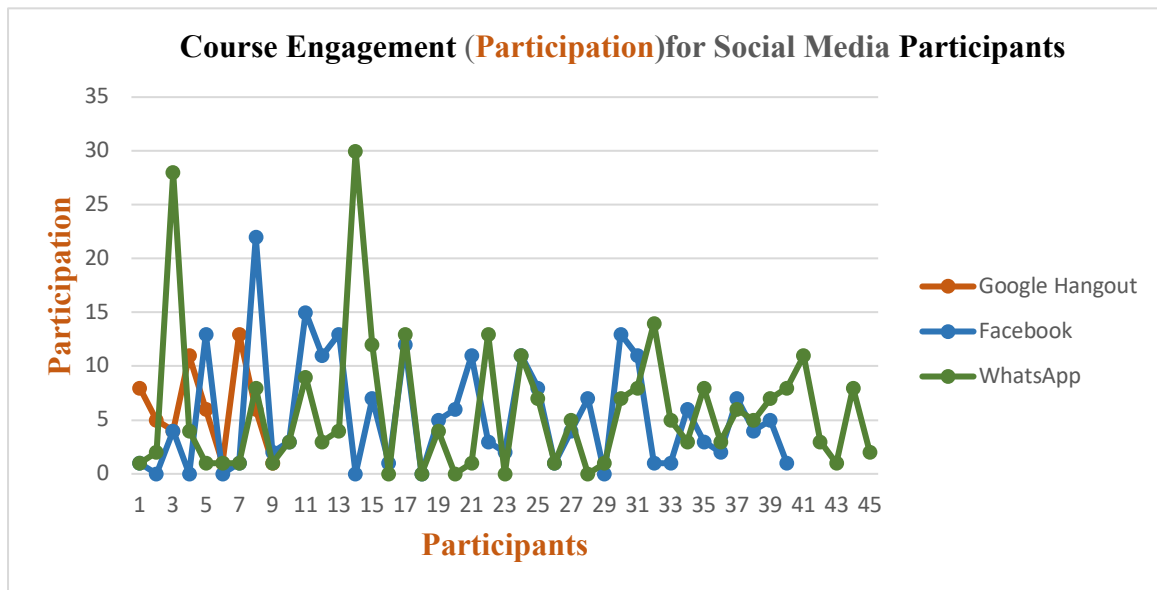


Figure 6.35. Course Engagement data (Participation) for social media participants

The Data below shows the course engagement of social media learners by social media platforms. Each page view, participation, activity volume and assignment of the learners on social media was individually calculated. The students were categorised by platforms and the total number of the variables were calculated as shown in the figure below. The results show that the variables page Views and participations are high in the WhatsApp group while for activity volume (time spent on course platform) there engagement is very similar for both the Facebook and WhatsApp's groups. For the assignments, 13 students who engaged in WhatsApp submitted the assignments follow by Facebook (7) and Google Hangout (3).

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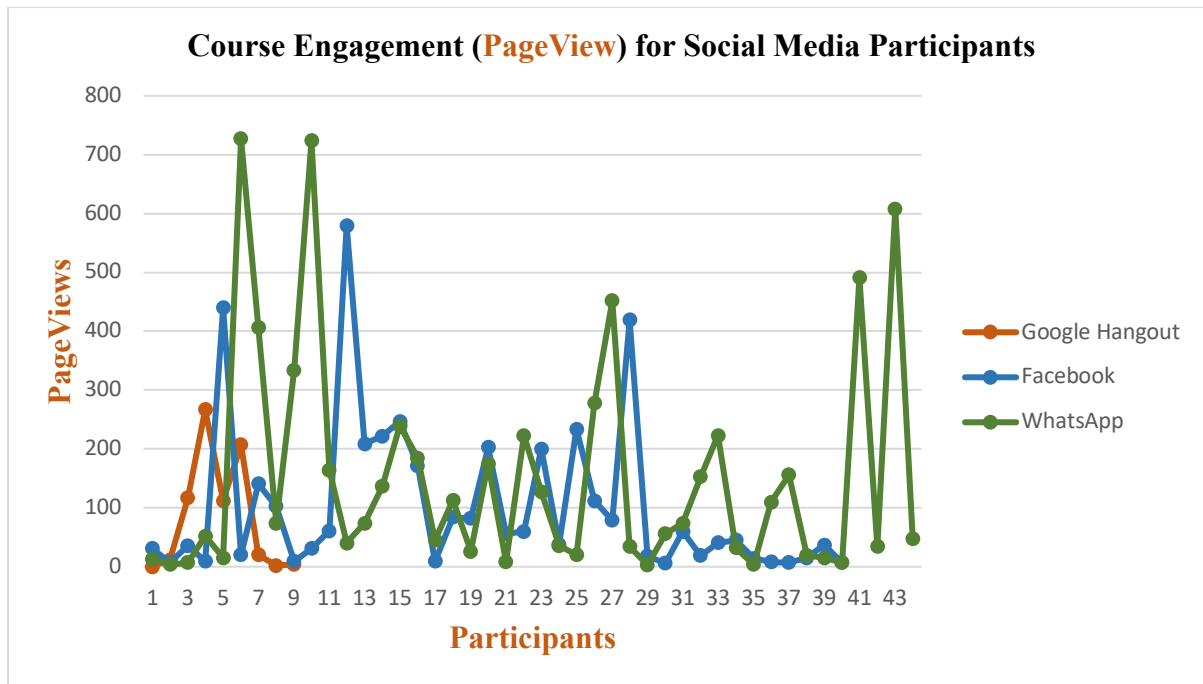


Figure 6.36. Course Engagement data (PageView) for social media participants

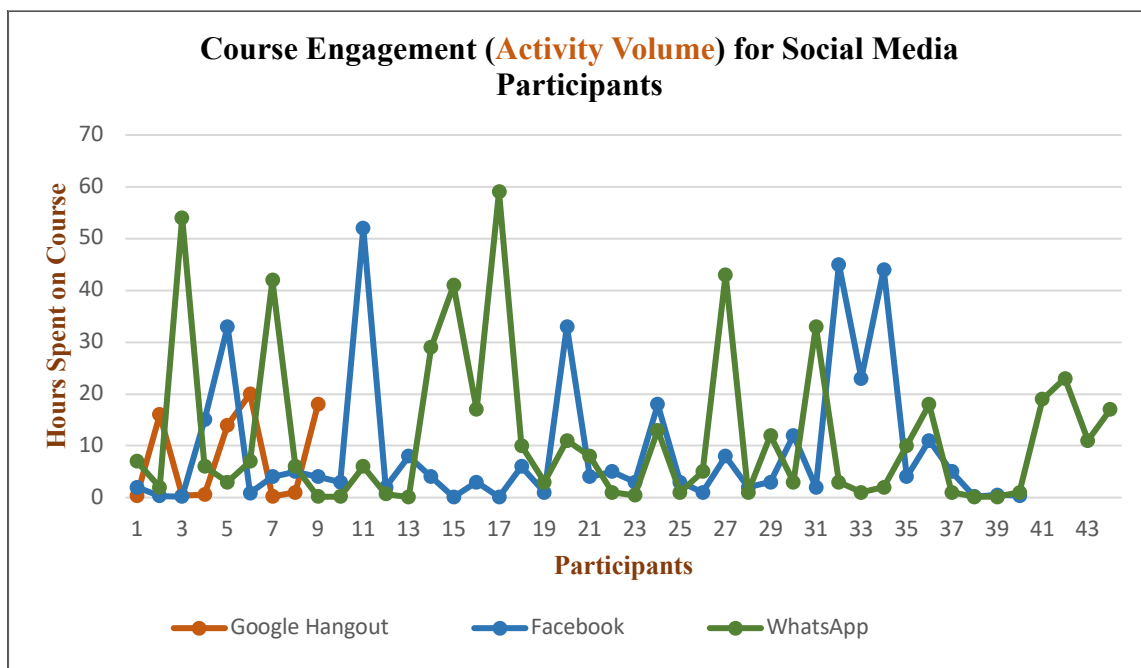


Figure 6.37. Course Engagement data (Activity Volume) for social media participants

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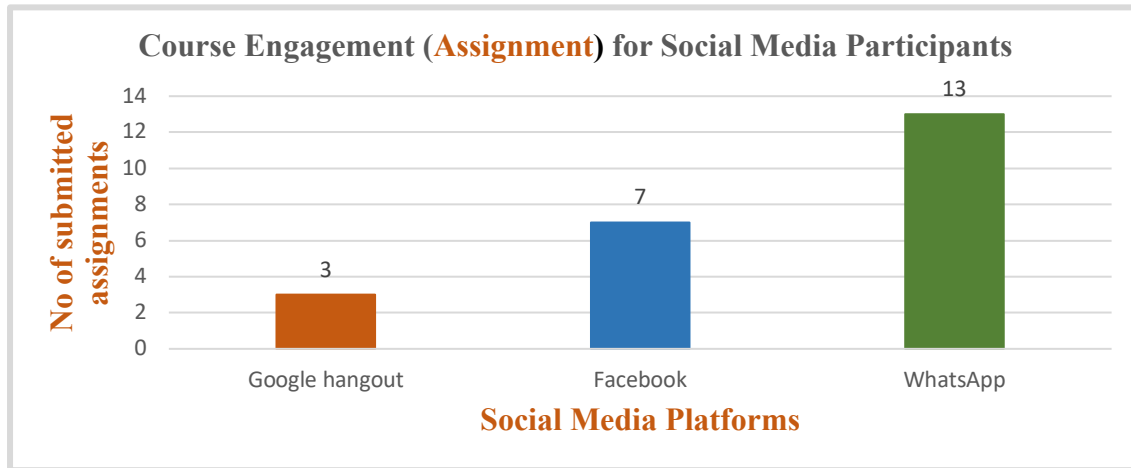


Figure 6.38. Course Engagement data (Assignment) for social media participants

6.5.6 Objective 5

To find out if there are significant differences in retention between MOOC learners who engage in Social Media and those who did not.

To meet the objectives 5 above, data on retention was extracted from the “*Course Analytics Section*” as described in objective 4. The data on every learner was obtained for the 2 groups SM (94) & NSM (195). The normality check was done as described in the participation variable section. As shown in Table 19, a normality test and descriptive statistics were performed to ascertain the normality of the data, which results in Table 19, P (0.000) value shows that the data is not normally distributed.

Tests of Normality

	Group	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Retention	1.00	.223	93	.000	.802	93	.000
	2.00	.315	194	.000	.641	194	.000

Table 18 : Normality test results

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Ranks

	Group	N	Mean Rank	Sum of Ranks
Retention	1.00	94	180.88	17002.50
	2.00	195	127.71	24902.50
	Total	289		

Table 19 : Table of Ranks

Histogram for retention

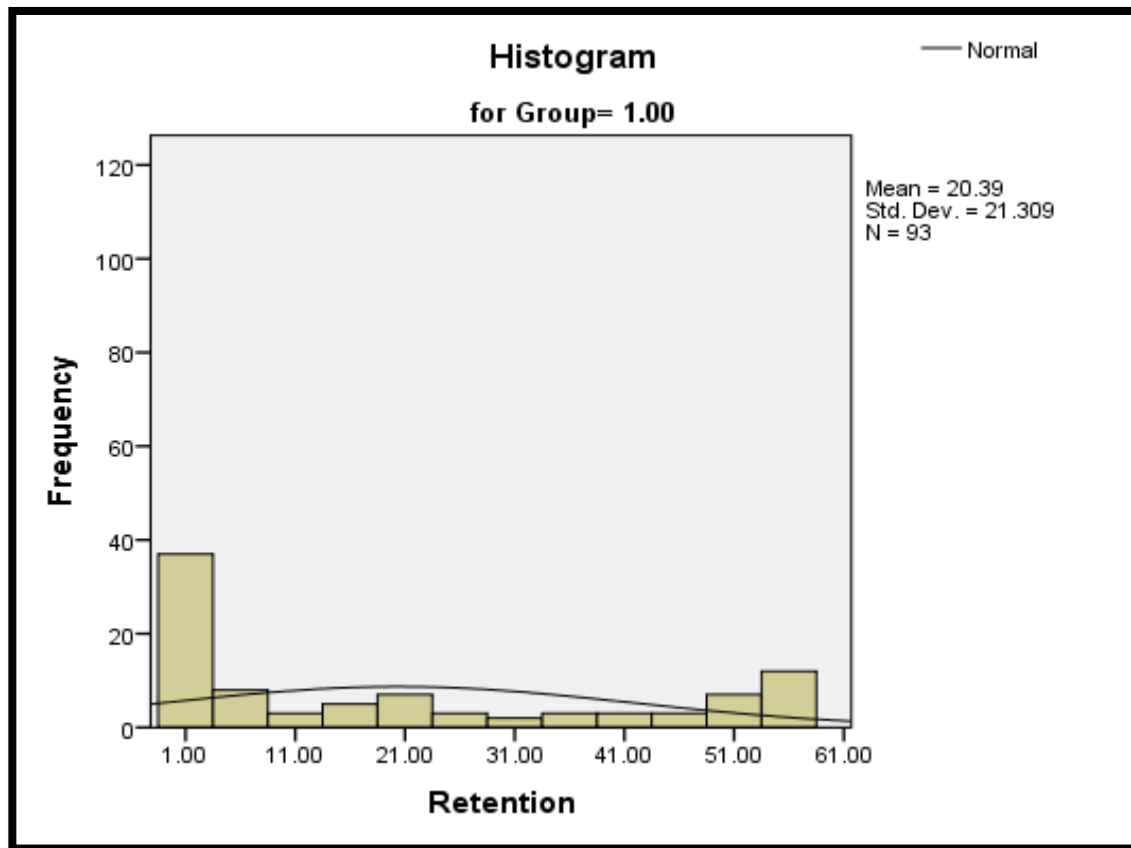


Figure 6.39 Histogram Showing The Frequency Distribution For Retention In Group 1

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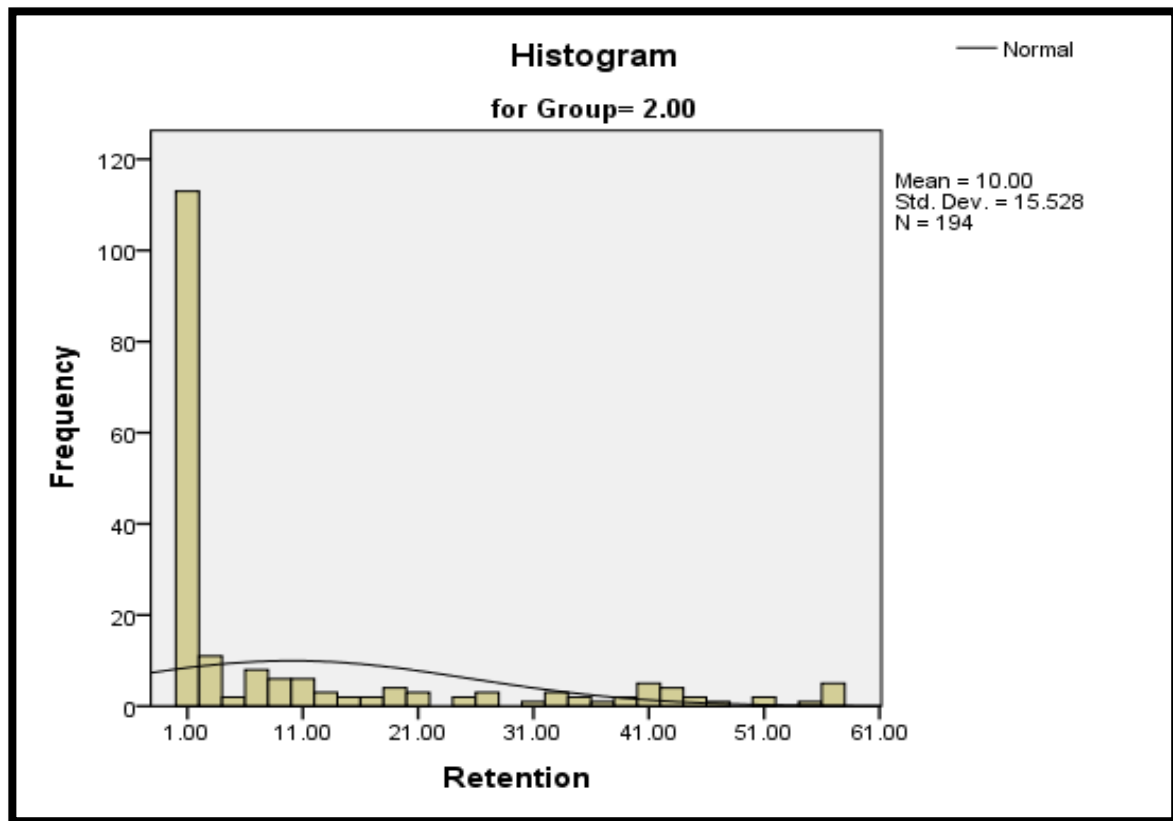


Figure 6.40: Histogram Showing The Frequency Of Distribution For Retention Variable For Group 2-(Non-Social Media)

Q-Q plot for Retention

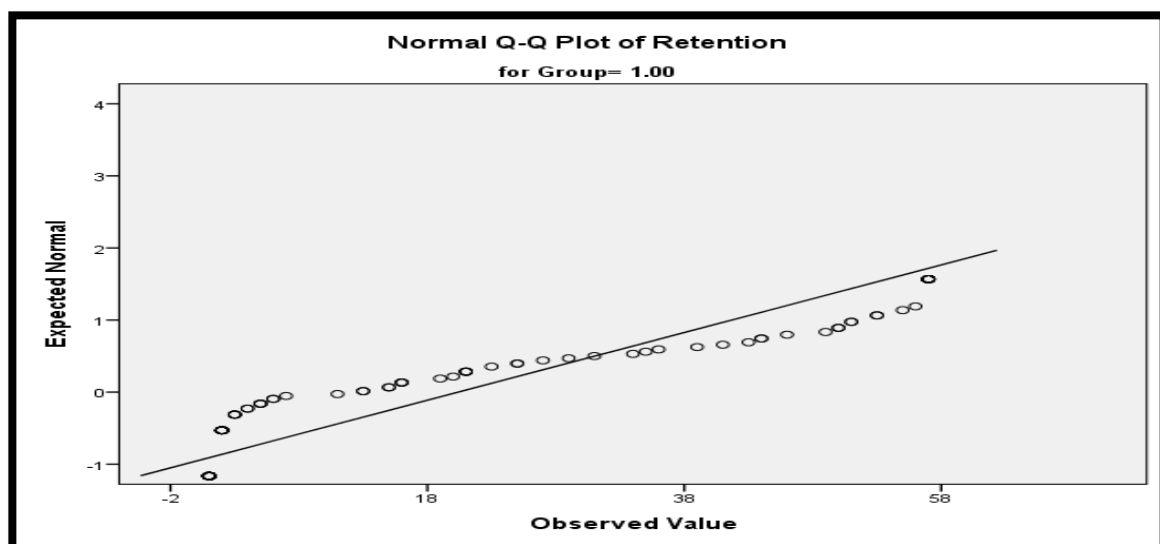


Figure 6.41: Q-Q Plots For Retention Variable For Group 1(Social Media Group)

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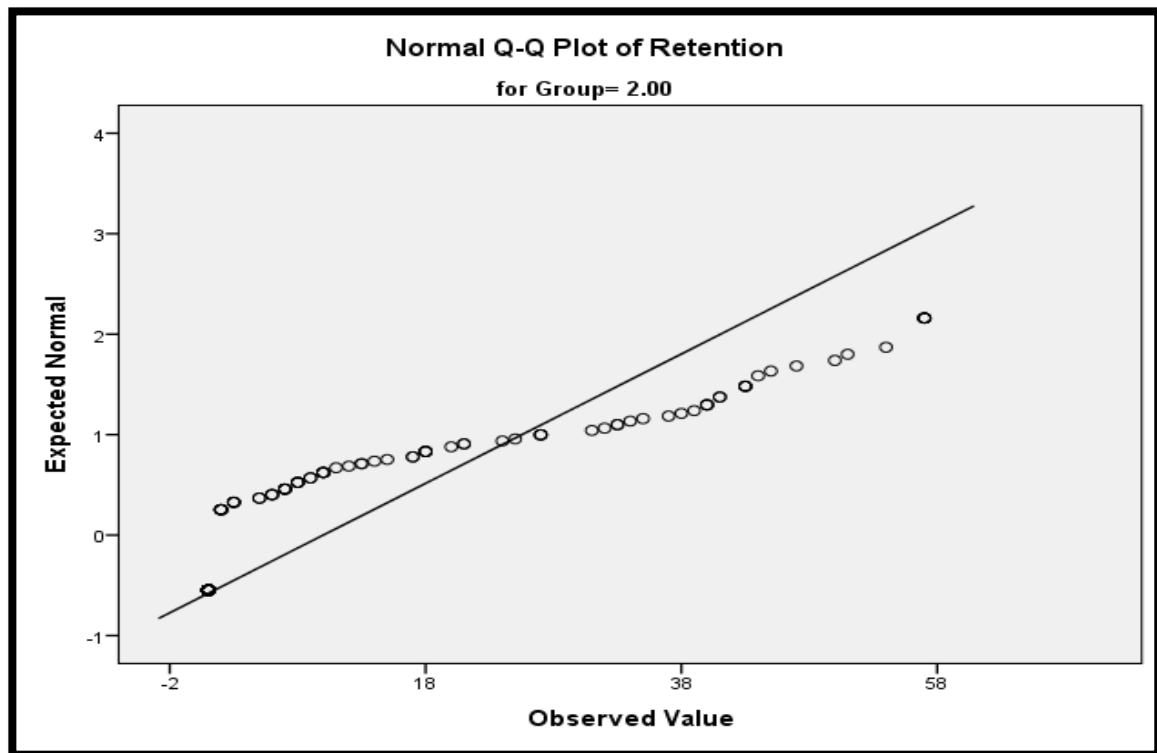


Figure 6.42: Q-Q Plots For Retention Variable For Group 2(Non-Social Media Group)

The Q-Q plot in figure 6.41 & 6.42 shows that the data did not cling to the line but falls outside the straight line.

Outliers for Retention

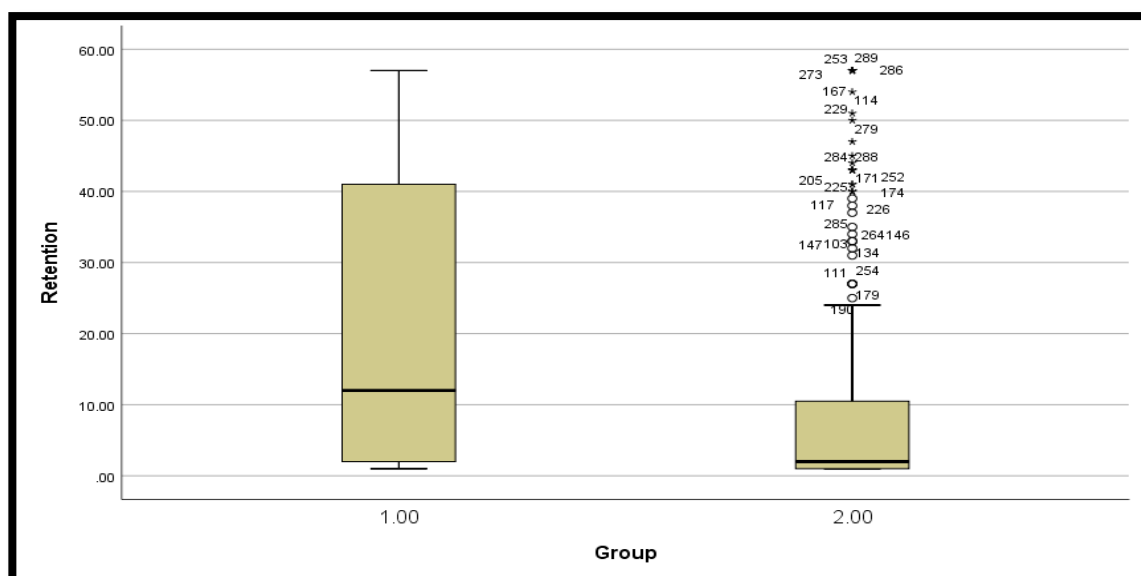


Figure 6.43 Box-Plots For Retention Variable

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Box-plot for retention showing outliers in group 2.

Test Statistics	Retention
Mann-Whitney U	5792.500
Wilcoxon W	24902.500
Z	-5.200
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Group	

Table 20: Test statistics for retention

Since all the five methods applied for identifying a normal distribution data shows that the data is not normally distributed, a Mann-Whitney U and descriptive statistics were undertaken to calculate if the differences in retention in students' engagement in social media and those not involved are significant. Further to this, the Mann-Whitney U test results show that the differences in retention in students who engage in social media, and those who did not, is significant ($z=0.000$, $p<0.05$). As 2-tailed significant value is ($p=0.000054$). Therefore, the findings from the Mann-Whitney U test support the alternative hypothesis that there is a significant mean difference in retention between social media and non-social media group.

The results show that there is a significant difference between social media and non-social media learners. Other factors that affected completion rate apart from engagement on social media from the responses of 37 students (Exit questionnaire-figure-6.44 & 6.45) showed that the quality of the material accounted for 12 (28.5%), learning platform 5 (11.9%), discussion of material 4 (9.5%), the balance between instruction and independent student work 3 (7.1%) and length of course 1 (2.4%). Also, in considering the learners' intention, 26 (26%; social media engagers) out of the 100 responses (welcome survey) indicated that they intended to finish the course. Out of the 26, 11 completed. However, results from the correlation between motivational factors and intentions showed that there was no correlation, which indicated that learners' completion could not be predicted from their intentions. Thus, apart from students' intent and other factors mentioned, it is evident from the results that social media played an important role in motivating social media engagers to stay longer on the course as compared to non-social media engagers.

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Exit Questionnaire Responses

The exit questionnaire was the last the students completed at the end of the course or on exiting the course. Only 37 people responded to the exit questionnaire out of 289. Below are the responses.

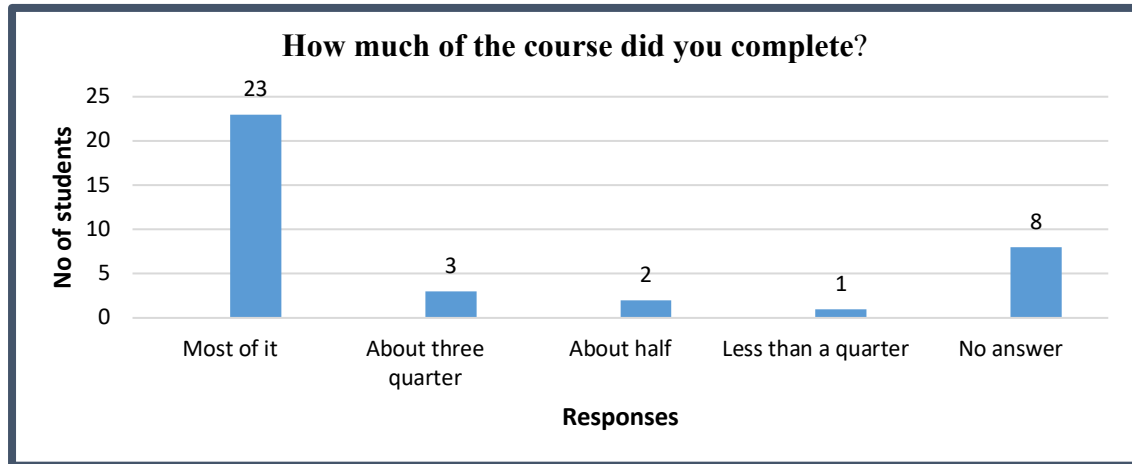


Figure 6.44 Responses on course completion

The results show that 23 (62%) of the responded completed most of the course while about three quarter 3 (8%), 2 (5%) about half and less than a quarter 1 (3%) and 8 (25%) did not respond.

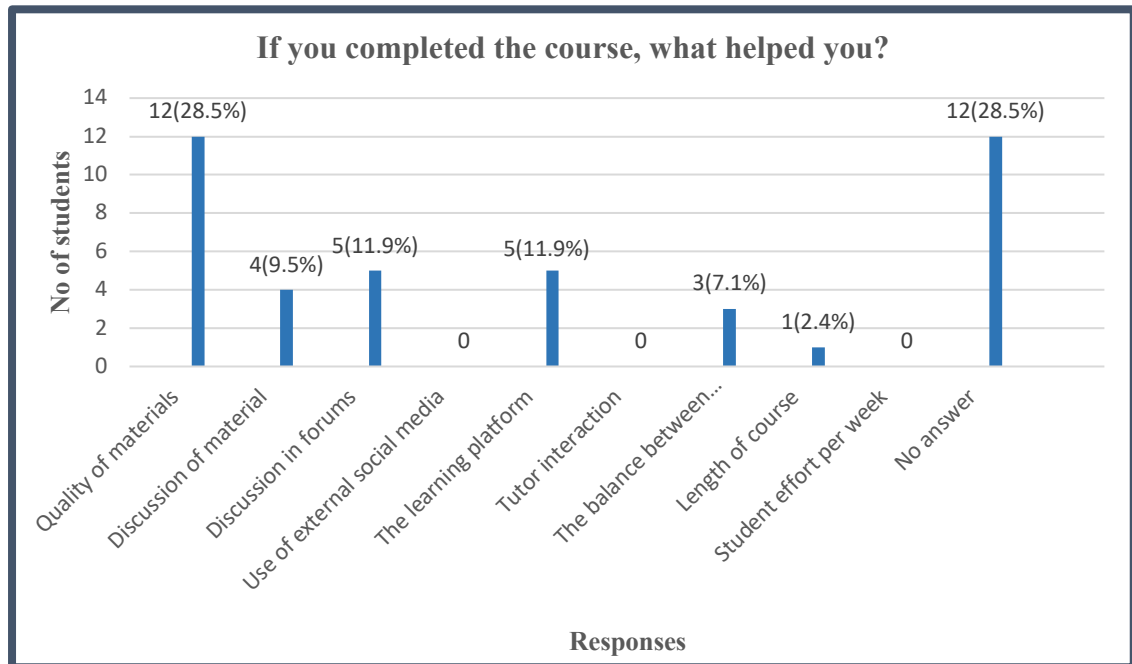


Figure 6.45: Responses On What Helped Students Completed The Course.

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The responses provided additional information on other factors that affected completion apart from engagement on social media. 12 (28.5%) of the students said it was the quality of the material, 5 (11.9%) learning platform, 4 (9.5%) discussion of the content, 3 (7.1%) the balance between instruction and independent student work and 1 (2.4%) length of course.

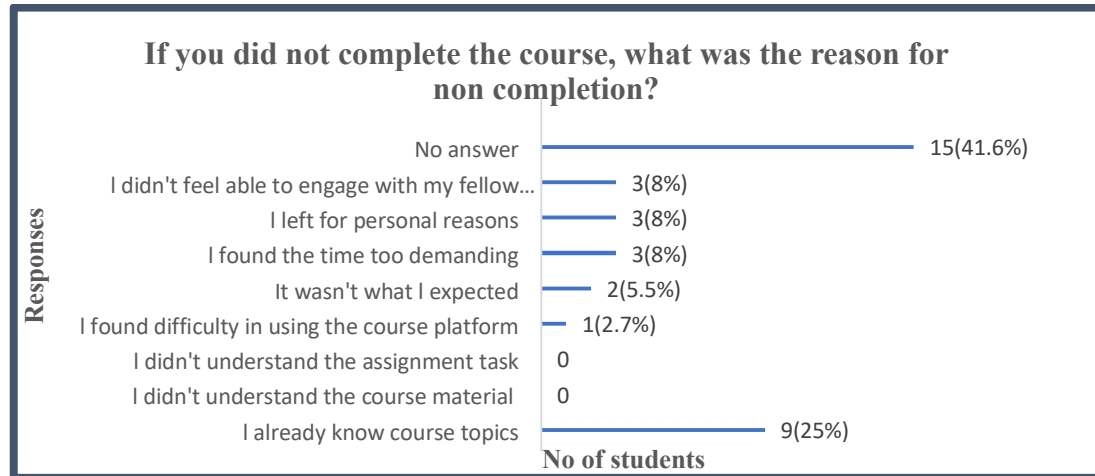


Figure 6.46: Responses On Non-Completion

From the responses, 3 (8%) said for personal reasons, 3 (8%) time too demanding and 3 (8%) didn't feel able to engage with fellow students on the platform, 2 (5.5%) said it was not what they expected, and 1 (2.7%) found difficulty in using the course platform.

Summary of findings regarding objective 4 &5

Table 18 shows an overview of statistical mean differences between social and non-social media engagers.

Variable	Significant differences	2 tail significant value
Participation (discussion threads)	No	0.449
Page view (number of pages clicked & view)	No	0.099
Activity volume (time spent)	Yes	0.035
Assignment	Yes	
Retention (no of participating days)	Yes	0.000

Table 21: Summary of objectives 4&5 findings

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Summary – (Retention)

Objective 5: To find out if there is a significant difference in retention between MOOC learners who engage in Social Media and those who did not.

From the result, $P (0.000) < 0.05$; therefore, we reject the null hypothesis and accept the alternative hypothesis.

H_0 There is no significant mean difference in retention between learners who engage in Social Media and those who do not.

H_1 There is a significant mean difference in retention between learners who engage in Social Media and those who do not.

6.5.7 Objective 6

To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC.

6.5.7.1 Qualitative Data

In the motivation questionnaire, learners were given the open-ended option to “*Mention three benefits and drawbacks for using social media in the course*”, and 51 students responded to the questions. In order to address the above objective, the data was extracted from the motivation questionnaire, which was administered through a link to Smart Survey. Using the 5 phase guidelines suggested by Braun and Clarke (2006), thematic analysis was applied to code the students’ response data. This includes acquainting oneself with the data, code generation, themes searching, theme revision, and theme definition, naming and producing the report. Thematic analysis was chosen because it captures the significant part of the data about the research question and denotes pattern level of responses or meaning within the set data (Braun and Clarke, 2006).

Analysis of the qualitative data survey responses helped to identify the first theme, which revealed that interaction online through social media assisted the learners by motivating them. The second case is that many learners profited from using social media to engage with a varied range of other learners, it helped them to network and exchange information, providing easy and fast communication, and quick responses to questions. Thirdly, it enabled them to prepare for the course, especially for the first time MOOC learners. Fourthly, it enhanced their social

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communication skills, improved learning and finally helped to get contributions for their business ideas. Finally, the fifth theme was revealing the drawbacks.

Theme 1: Motivation.

The learners report that social media motivated them to continue in the course. They also said that it enhanced their various social communication skills and their process of learning process by using Google hangout, Facebook and WhatsApp on the course, endorsing other studies (Brownell and Swaner, 2010; Dodge and Kendall, 2004; Kassens-Noor, 2012; Salmon, et al., 2015). They also emphasise that social media was valuable for getting quick feedback to their questions, which improved communication with peers and motivated them. Some learners stated:

-Keeping me motivated

-Contributing to attaining my goals

-Helped me to know myself, challenges on how to grow.

-The discussion also heightened expectations of the course

- Motivated me to join the course

-Discussions on the topic heightened my anticipation

-I think the instantaneous messaging (WhatsApp) keeps one updated much more frequently without having to open a browser to discuss issues. For me, it helps me squeeze time to read the discussions, which I may not have done if I had to fire up a browser. So, WhatsApp sort of prompts one to be involved. It is like a class bell. I think WhatsApp has kept me more engaged than I would have without it.

Theme 2: Networking

Learners spoke the benefit of with people from different countries, backgrounds and professions, which helped in giving them more significant insights into their business plans and ideas. This confirms other research reports (Salmon, et al 2015; Saijang, et al 2016). One learner state:

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- I enjoyed the interactions and connectivity among the learners*
- Sharing my business ideas and experiences with other learners helped me to get a better understanding of my business.*
- I believe using social media will help network with course mates during and after the courses for possible synergy of ideas and procedures.*

Theme 3: Orientation

Some of the students reported that it was their first time engaging in online learning. The interaction on social media before the start of the course helped to prepare them for the online course, by getting information from other experienced learners on how to survive a MOOC. Some of the learners' state.

- Engaging in the Course Facebook Group helped me to get a better understanding of learning in the MOOCs before the course started.*
- It helped me understand what the course was about early on and helped me to decide my level of participation.*

Theme 4: Improved learning

Many of the learners that social media was useful for the exchange of ideas and gathering information, which improved their outcome of learning by expediting discussion with peers and sharing resources reported it. WhatsApp also served as a huge spark for discussions as communication was swift and response time was fast. Some learners note:

- Reviews on other people's entrepreneurial ideas and dreams is a significant boost to my plans*
- Very supportive*
- The continuous flow of communication*
- Fulfilling needs that are not being met offline*
- Sharing my business ideas and experiences with other learners help me to get a better understanding of my business.*
- Encourage openness*
- I gained from the diverse experience of both experts and skills people.*

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Theme 5: Drawbacks

However, some students reported some drawbacks, which had to do with having to give their telephone number in the case of WhatsApp, sharing their business plans and sometimes posting of irrelevant materials on WhatsApp. Some of the learners wrote:

- Can be cumbersome sometimes to catch up on so many chats.

-One drawback is I felt a bit awkward talking about my plans to strangers. I was more comfortable reading other people's plans.

-The only "drawback" was that I was not feeling comfortable to share my mobile number (WhatsApp). That is why I did not engage in that platform.

- I felt a bit reluctant talking about my plans though I later learnt from the course that it was OK to seek collaboration.

Many studies have report social media benefits such as sense of community (Zheng, 2015); improving learning, networking Salmon et al. (2015); and some of the drawbacks such as time, privacy issues, distraction (Aghili, 2014; Davies, et al., 2010; Jones, et al., 2010; Land and Bayne, 2008; Veletsianos and Navarrete, 2012). The benefits of social media from the results of this study confirm most of these findings in terms of networking, improving learning, motivation and orientation. This study has also shown that engagement in social media Pre-MOOC had an impact on students' motivation to start the course and helped to prepare learners for the MOOC.

For instance, one of the students stated, *"It helped me understand what the course was about early on and helped me to decide my level of participation"*.

6.6 WhatsApp Focus Group Study

6.6.1. Introduction

The aim of the focus group study was to obtain additional data to answer objective 6, which is to discover three benefits and drawbacks of using social media for interactions during the study. Nevertheless, because of the level of communications on the WhatsApp forum, the study went further to carry out a focus group study to gain a deeper understanding at the individual level.

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This section is the final piece of this study, whereby students shared their experiences and reasons for choosing WhatsApp for interactions. This section connects with Objective 6, which is to " *To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC*".

The results presented explore individual experiences. The questions were 1. *Why did you choose WhatsApp?* 2. *What impact did it have on your learning?*

6.6.2 Results of the WhatsApp Focus Group

The participants were students who engaged in WhatsApp interactions, 25 of the 41 participants responded to the questions posted on WhatsApp.

The identification of the themes was made using the steps described in chapter 4.8.2; the data was also systematically (co)analysed and (co)checked by three colleagues (PhD researchers) which strengthened the level of triangulation. The comparisons, moderation and a thorough discussion of the data were carried to enhance the data processes of triangulation to produce great inter-reliability levels and deal with inconsistencies that arose (Creswell, 2009). The researcher and colleagues who re-examined the data resolved the discrepancies by inviting another colleague, a statistician, to have a look at the responses/theme to get a third opinion.

6.6.3 Quantitative Data Analysis of WhatsApp Focus Group

Below shows, the total number of posts including images, links and videos posted on the WhatsApp course forum. The participants excluded the messages posted by the facilitators because it was essential to separate them to know the actual post.

No of Participants on the platform	No. of respondents to survey question	Posts(text)	Weblinks	Videos posted	Images	Grand Total (Posts)
44	25	768	34	11	8	821

Table 22 The Breakdown of the Posts on the WhatsApp Course Forum.

The table above shows the quantitative analysis of the breakdown of posts on WhatsApp platform.

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The total number of participants on the forum was 41, and 25 of these responded to the survey question. The total number of posts was 821, with a breakdown of 768 being text, 34 links, 11 videos and 8 images.

6.6.4 Content Analysis Results

The purpose of the focus group studies is to get a deeper understanding of the students' choice of WhatsApp and its benefits. It is part of the answer to objective 6.

“To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC”.

The survey questions invited students to reflect on why they chose WhatsApp to support their learning and its impact on their learning. The results in Table 24 shows the summary of findings. The tabulated results are from their "raw" format and are direct quotes from the participants. Reporting the results using students' quotes allowed for an understanding of how students perceived experiences and expression about their use of WhatsApp social network sites without losing meaning in translation. This was undertaken in addition to the thematic analysis.

Theme 1: Time saver Some of the participants commented that the reason why they chose WhatsApp was that it saved time, and they did not need to log in. One of the participants said:

“It saves time, it is very encouraging, and it has improved my social life”. Another participants stated: *“I chose WhatsApp because it is easy to access; quick and I do not need to log in. It enabled me to communicate easily with my fellow learners, and I get my questions answered within minutes”.* This study agrees with the findings of Gon and Rawekar, (2017), who report in their studies that students found WhatsApp useful for their learning, as the App was easy to download. It enabled students to get access to learning resources quickly.

Theme 2: Faster means of communication

Quick access to information was another reason for the choice of WhatsApp. The response below shows that with WhatsApp, it enabled students to respond quickly and shared ideas. According to Onah, Sinclair and Boyatt (2014b), a lack of quick responses in MOOCs forums causes frustration and dropout among students.

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Therefore, WhatsApp could serve as a valuable learning tool to enhance deeper engagement and faster responses among students and instructors.

“It's also a fast means of reaching out to other course group members, getting and sharing ideas, getting quick responses from each other”.

Theme 3: Instant messaging service

Participants mentioned that the instant messages they received also contribute to their choice of the mobile App.

“I think the instantaneous messaging (WhatsApp) keeps one updated much more frequently without having to open a browser to discuss issues”.

2. The impact of WhatsApp on learning.

Theme 1: Facilitated learning and WhatsApp features

About 10 of the participants indicated that using WhatsApp, throughout the duration of the MOOC improved their knowledge by enabling discussion with peers, sharing of images and videos. These participants also reported that several helpful social features of the process of learning improved by using WhatsApp, similar to other studies by (Brownell and Swaner, 2010; Dodge and Kendall, 2004; Kassens-Noor, 2012; Salmon et al., 2015).

The WhatsApp also served as a spark for discussions, which provided support. One participant noted:

“It's an excellent tool that provides support, networking, audio & videos sharing that has a great impact on me in the course of being part of this MOOC”. Other participants mentioned that: *“It has improved my social life. I find it very easy and useful, for example, I have learnt a lot from chatting with other business friends, sharing video, voice messages”.*

Kustijono and Zuhri (2018) emphasise the benefits of WhatsApp as enhancing learning when they reported that WhatsApp and Facebook are useful because it improves critical intellectual skills of students through the rudiments of examining, creating ideas, relating, and expressing ideas and assessing.

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Theme 2: Availability

The participants report that because of the availability of WhatsApp, they were able to connect with students from a different location with WhatsApp to further their learning. One of the participants stated:

"It has a wider coverage of users globally. Accessibility is easy by time by time, location, convenience and also, having information." Also, and another student stated:

WhatsApp support my learning because I have access to it 24/7. With its alerts, I am always available for the course as well as for learning wherever I am. Even in the crowd, while travelling, in social events etc. I can peep into WhatsApp and learn. The cool thing is that nobody will mind it because it is very normal to look at your mobile whenever you like."

Participants wrote of the advantages of interacting with learners from diverse places, backgrounds and professional associations when engaging on WhatsApp.

Another participant mirrored a similar experience above:

"It enabled me to share business ideas with other people across the globe who may not have been possible with face to face communication."

Both of these responses, provided by the learners, showed how the MOOC participants strongly sensed that they belong to a significant online learning community with communal aims, and in relationship with their peers on WhatsApp. This assisted generally their learning and enriched the MOOC experience. Ron and Roweka (2017) also state this observation; Jarkat (2014) also report that mobile learning growths and the flexibility accessibility to a variety of learning materials individually at anytime and anywhere.

Theme3: Frequent updates on the course

The participants said that WhatsApp enabled them to get some updates on the course without logging in to the main course forum, as it allows them to squeeze out time to quickly read the discussion on the forum. For instance, this respondent expresses it.

"I think the instantaneous messaging (WhatsApp) keeps one updated much more frequently without having to open a browser to discuss issues. For me, it helps me squeeze time to read the discussions, which I may not have done if I had to fire up a browser. Therefore, WhatsApp rather prods one to be involved. It is like a class bell. I think WhatsApp has kept me more engaged than I would have without it."

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This comment agrees with the findings of Bicen (2017) where they studied the choice of social interacting tools on a MOOC, mentioned that learners preferred to obtain information on course updates on the course social media rather than MOOCs platform. Furthermore, they reported that students preferred to follow daily their social media accounts.

Theme 4: Connectivity and networking

WhatsApp has a broader coverage of users globally, as report by Statistica (2018) of having over 2 billion monthly users. Accessibility is easy by time, location and convenience. Also, having current news and information. One of the participants wrote:

"I am connected to people with global knowledge in terms of entrepreneurial ideas which is having a positive impact on my business ideas. It is a classroom online for me that I learn a lot".

"It enabled me to share business ideas with other people across the globe who may not have been possible with face to face communication".

Theme 5: Quick Responses

Participants also comments that the interaction on WhatsApp assisted them in getting quick responses on questions asked which saved time. One of the students stated:

"It enabled me to communicate easily with my fellow learners, and I get my questions answered within minutes and I am able to share my business ideas with others straight away. Also, it saves time and I had learnt lots from fellow learners as much as in the course, especially before the course started."

Also, another participant wrote:

"The speed at which we could share resources more, so I was amazed. I would sit, I could interact even when away from my computer. WhatsApp has heightened my level of interaction with my fellow students as it is so easy to give updates at every given time."

According to Onah, Sinclair and Boyatt, (2014), lack of swift and strong response from the teacher contribute to learners' moods of frustration. To find solution to resolve these problems, Purser, et al., (2013) recommend that by motivated learners to interact during the MOOC course period, as peer learners, using social media sites such as Google+, Twitter and blogging, can support the socially networked 'peerogogy' open online education model.

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Therefore, the use of WhatsApp in MOOCs can be a useful tool to facilitate quick responses among peers and tutors.

Theme 6: Motivation and Sense of Community

Students on WhatsApp also mention that they were motivated while engaging with their peers on the platform.

A student in the focus group expressed that in his experience as he says:

“Continuous learning, a sense of belonging, being with likeminded people in the group, 24/7 access to knowledge sharing, guidance for learning the subject etc. have enormously enriched and enhanced my learning, which was possible because of WhatsApp”.
Similarly, two participants reported the same experience:

“Without joining the WhatsApp group, I would have probably opted out of the course, but the support, bond, network, videos, sharing of ideas has had a great impact on my learning experience and persistence to the end”.

"You could feel more connection between delegates. I notice that using WhatsApp as a facilitation tool to run a MOOC made it more engaging and involving."

The finding also supports the work of Amry (2014) who report that mobile learning is a primary factor prompting students' motivations to participate in social interactions.

Theme 7: Sharing of resources

One of the benefits was sharing resources frequently electronically within the groups, something stated as being valuable during the interviews. Students expressed being able to direct students towards consistent and trustworthy sources as helpful. This statement also supports the reports of Raiman, Antbring and Mahmood (2017) who report in their studies that WhatsApp facilitated the sharing of resources among students. For instance, one of the students commented

"Social media, the fastest means of getting and sharing the information which is very vital in communication."

Theme 8 Distraction:

Notwithstanding the benefits, one participant state that using WhatsApp in the course sometimes causes distraction as one of the participants said:

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“While my experience has generally been positive using WhatsApp this way, there are times I felt it was a bit intrusive. It interrupted my normal flow of activities. I normally attend to MOOCs during my own time. However, the messages sometimes forced me to abandon what I was doing to consider the content. While it prevented the course from slipping out of my mind on account of work, it interrupted my work sometimes even if I don't intend to respond immediately”.

This statement disagrees with the findings of Raiman, Antbring and Mahmood, (2017) in their studies, none of the students felt the use of instant messaging was intrusive. Furthermore, they report that one student stated the benefit of being able to regulator notifications on their mobile phone and allowing only notifications through study hours.

Participants	Question 1 Why you chose WhatsApp? (responses)	Question 2 Does the impact have on your learning? (responses)
1.	<p>It saves time</p> <p>It is very encouraging</p> <p>It has improved my social life.</p>	<p>I find it very easy and useful; for example, I have learnt a lot from chatting with other business friends, sharing video, voice messages.</p> <p>It enabled me to share business ideas with other people across the globe who may not have been possible with Face-to-face communication.</p>
2.	It is free, no charges.	For me, it is an excellent choice of quick and reliable media of communication. It has improved my entrepreneurship strength.
3.	The reason for choosing WhatsApp to support my learning is that I have access to it 24/7. With its alerts, I am always available for the course as well as for learning wherever	Continuous learning, a sense of belonging, being with like-minded people in the group, 24/7 access to knowledge sharing, guidance for learning the subject etc. Have enormously enriched and enhanced my learning, which was possible because of WhatsApp.

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	<p>I am. Even in the crowd, while travelling, in social events etc.</p> <p>I can just peep into WhatsApp and learn.</p>	<p>The cool thing is that nobody will mind it because it is very normal to look at your mobile whenever you like.</p>
4.	<p>I think the instantaneous messaging (WhatsApp) keeps one updated much more frequently without having to open a browser to discuss issues.</p>	<p>For me, it helps me squeeze time to read the discussions, which I may not have done if I had to fire up a browser. Therefore, WhatsApp sort of prods one to be involved. It is like a class bell.</p> <p>I think WhatsApp has kept me more engaged than I would have without it.</p>
5.	<p>I chose WhatsApp because it is easy to access, quick and I do not need to login. It enabled me to communicate easily with my fellow learners and I get my questions answered within minutes.</p>	<p>I can share my business ideas with others straight away. Besides, it saves time and I had learnt lots from fellow learners as much as in the course, especially before the course started.</p> <p>It has prepared me for the course because it's my first time of taking a MOOC. I see it an excellent tool for orientation and also mentoring.</p> <p>Without joining the WhatsApp group, I would have probably opted out of the course but the support, bond, network, videos, sharing of ideas has had a great impact on my learning experience and persistence to the end.</p>

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6.	It is very encouraging, as I don't spend much on it.	<p>WhatsApp has helped me in learning, as it makes leaning very easy to communicate with other learners and friends.</p> <p>It enables me to share business ideas with friends' families, which would not have been easy to see or speak to, and it saves time too.</p> <p>It has improved my social life more as I chat with others.</p> <p>It has enabled me to know much friends.</p> <p>It has really helped me a lot and I am blessed with it.</p>
7.		<p>You could feel more connection between delegates.</p> <p>I notice that using WhatsApp as a facilitation tool to run a MOOC made it more engaging and involving.</p>
8.	I find this social media as the fastest means of getting and sharing information, which is very vital in the business world. In addition, the ability to communicate without the restriction of time and distance made very convenient and appropriate for me considering my schedule.	<p>It has also improved my social life.</p> <p>It gives me joy each I receive messages especially inspiring messages.</p>

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9.	Social media, the fastest means of getting and sharing information, which is very vital in communication.	<p>It is an excellent tool that provides support, networking, audio & videos sharing that has a great impact on me in the cause of being part of this course.</p> <p>Without the restriction of time and distance and convenient, it's very appropriate for considering schedule and has helped to improve the social and economic life of people.</p> <p>It gives peace of mind as it has a multiplier effect on every endeavour of life.</p> <p>Social media network has no Boundary.</p>
10.		It has made our interaction here very smooth and convenient, enabling easy learning.
11.	While my experience has generally been positive using WhatsApp this way, there are times I felt it was a bit intrusive.	<p>It interrupted my normal flow of activities.</p> <p>I usually attend to MOOCs during my private time. However, the messages sometimes forced me to abandon what I was doing to consider the content.</p> <p>While it prevented the course from slipping out of my mind on account of work, it interrupted my work sometimes even if I do not intend to respond immediately.</p>
12.	Social Media is common for learners to learn and exchange	We do not need to go to school; we can learn knowledge everywhere every time we want.

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	experience with people from different countries.	<p>Especially convenient for business people and housewife/househusband.</p> <p>I recommend using WhatsApp for learning. Moreover, thank you for every learners and teacher.</p>
13.		<p>The speed at which we could share resources more, so links amazed me. I would sit I could interact even when away from my computer. WhatsApp has been a very useful tool in this course. First, it is because we interact with it on a day-to-day basis, therefore posed no technical challenges to us.</p>
14.	It is very encouraging, as I do not spend much on it.	<p>It has improved my social life more as I chat with others.</p> <p>It enables me to share business ideas with friends and families, which would not have been easy to see or speak to, and it saves time too.</p> <p>It has enabled me to know much friends. It has helped me a lot and I am blessed with it.</p> <p>WhatsApp has really helped me in learning, as it makes learning very easy to communicate with other learners and friends.</p>
15.	I notice is that using WhatsApp as a facilitation tool to run a	You could feel more connection between delegates.

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	MOOC made it more engaging and involving.	The medium is also much more effective in helping to resolve and troubleshoot user access issues and in responding to queries, questions or comments etc.
16.	I find this social media as the fastest means of getting and sharing information, which is very vital in the business world.	<p>It has also improved my social life. It gives me joy each I receive messages especially inspiring messages.</p> <p>Also, the ability to communicate without the restriction of time and distance made very convenient and appropriate for me considering my time schedule.</p>
17.		WhatsApp has heightened my level of interaction with fellow students my clients, as it is so easy to give updates at every given time.
18.	It's also a fast means of reaching out to other course group members, getting and sharing ideas, getting a quick response from each other.	<p>Using WhatsApp made the learning process easy.</p> <p>Using WhatsApp on the course group made it easier to get information when I do not log in to the website.</p>
19.	Information moves faster on WhatsApp's and you get instant feedback.	<p>Using WhatsApp for this course is the best thing that has happened, especially for someone like me that is not into the other social media.</p> <p>WhatsApp is so I feel it's the best thing you people have done for us.</p>
20.		Using WhatsApp has been quite an excellent experience, especially for such a course as

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		this; it has exposed me to a whole world of opportunities and advantage in using social media.
21.		The use of the WhatsApp medium on this course represents a breakthrough in the way new knowledge can be disseminated and absorbed.
22.	For starters, you get instant feedback on ideas and proposals; likewise, one is able to communicate any salient information to fellow participants within a matter of seconds to all involved at the same time.	This can, therefore, be seen as one of the preferred mediums for teaching and learning for the future.
23.		Using WhatsApp for this course was a good thing. It was engaging and informative. It was a platform of discussion for all the students.
24.		Using WhatsApp has enabled me to exchange information with other users, it has opened door to new experiences and future opportunities.
25.		Messages from WhatsApp are very short and helps one reflect on their learning, as well as helping to design better courses.

Table 23: Responses of participants in the WhatsApp focus group

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6.6.5 Summary of WhatsApp Focus Group Studies

The quantitative results show that there were 820 posts, including links, video and images. Content analysis shows that students perceived reasons for choosing WhatsApp for interaction included, timesaving, faster means of communication and instant messages services. Besides, concerning its impact on their learning, some of the themes that emerge from the responses included motivation and sense of community, the features such as video/audio sharing, connectivity and networking, quick answers, frequent updates on course and sharing. However, a drawback was “*distraction*” which one student commented on. These findings support the study by Basal and Joshi (2014) who report that 56% of participants indicated that learning through mobile application for academic purposes has academic benefits such as fast interactions with facilitators, sharing learning materials, easy access to learning materials, instant response, better clarity on issues and constant availability of materials.

6.6.6 Summary of Chapter

This Chapter first presented the results of the data collected from the questionnaires in the study specifically designed to measure the impacts of social media engagement on students’ motivation in MOOCs.

The chapter offered a detailed analysis of data from the study which addressed each of the research objectives. A detailed analysis was done on the datasets to ascertain if the datasets for each objective is normally distributed. Additionally, the chapter then discussed the statistical approaches used for examining each dataset and the justification for the selected analytical method. The data was analysed using a non-parametric measure (Mann -Whitney U test), as the distribution of data was found to be not normal in all cases. The interpretation of the data set was through the research objectives in each study in substantial details. There were significant mean differences between the social media group and non-social media group in terms of activity volume, assignment and retention. No mean differences in relation to the page views and participation variables.

The chapter also analysed the responses from the focus group study on why students chose WhatsApp and the impact it had on their learning. Extending the thematic analysis from the qualitative data in objective 6, the emerging themes were identified and discussed. The

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study revealed that students chose WhatsApp because of the accessibility, easy and fast responses, and engaging in WhatsApp affected their learning by motivating, networking, sharing, clarity and quick responses etc.

The conclusion the study is discussed in the next chapter discusses the conclusions drawn from the findings of the study and possible future work.

CHAPTER 7

CONCLUSION & FUTURE WORK

In this chapter: Section 7.1 gives a summary of the research, section 7.2 discusses some of the strength of the research design, section 7.3 contribution to knowledge. Section 7.4 discussion, section 7.5 conclusion, section 7.5.1 pieces of evidence of the impact of social media engagement on course start, motivation, retention and completion in the MOOC study and section 8.0 brief discusses on limitations and future work.

7.1 Summary of the Research

This research set out to investigate the impact of social media on student's motivation in MOOCs. Considering this, the investigation started by developing the research question and the goals of the study, which are outlined in Chapter 1. However, as the research progressed, the contents of the research aim evolved, its focus shifting to whether social media can impact students' motivation, this updated focus being developed following literature review and following the results of the 1st MOOC. The development of the research question was more fully explained in Chapter 2.

Chapter 2 explains the current research in the field and how the review was used to refine the research question developed in Chapter 1. A literature review to date confirmed the positive effects of social media on MOOCs. First, a brief history of MOOCs, their taxonomy, the pedagogical concept, learning theories, issues and challenges concerning MOOCs, was examined in this chapter. In addition, social networking and web 2.0 technologies, their uses, impact on learning and challenges of incorporating them in online learning, including MOOCs, were then discussed. The chapter continues with the presentation and review of students' engagement online and in MOOCs, and methods of measuring students' engagement.

The review also show that the issue of retention and motivation is one of the most critical topics in MOOCs. Based on these results, social media background and how it affects students' motivation in MOOCs was explored in detail, which led the study to research the impact of using social media before the start of the MOOCs and during the course study period.

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Taking into consideration a number of issues concerning the students' motivation and retention, it also became obvious that the research required a bigger focus on students' motivation, which necessitated the redefinition of the research question and the development of a modified research question: *"What is the impact of social media engagement on students' motivation in MOOCs?"* With the aim *"To find out if the incorporation of social media alongside a MOOC can have an impact on learners' motivation, course engagement and retention"*.

The research ran a MOOC titled "Entrepreneur and Innovation" for five continuous weeks, although students were allowed some additional time (3 weeks) at the end to submit their assignments. Those who indicated an interest in engaging in social media (Facebook, Google Hangout and WhatsApp) interacted and shared information. Students were reminded that Canvas was the official course platform and all answers and questions had to be directed to the Canvas forum. The data of responses from the questionnaire were analysed. Results also suggest that designing a MOOC in such a way that could keep students engaged pending the start of the course could enhance the sense of community and allow students to build connections, which is vital in sustaining students' motivation from the start and throughout the course. Furthermore, the results also show that there were significant mean differences between social media engagers and non-engagers in activity volume, assignment and retention. Also, students' intentions for taking the course were considered since these can affect their completion. The results show that there was no correlation between student's intentions and completion. In other words, students' completion could not be predicted from their initial intentions. The qualitative results also reveal that engagement on social media helped in motivation, networking, and orientation and improved their learning. Some drawbacks report by students includes having to catch up with volumes of chats on the social media platforms, worries about giving their phone numbers for WhatsApp chat and discussing their business plans.

The objectives were as follows:

Objective 1. *To find out if early engagement in social media increases the number of students who start the MOOC from those who have registered.*

From the results, it shows that 92.5% of those who engaged in social media started the course compared to 70.7% who did not engage in social media began.

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The qualitative results of shows that some students mentioned that participating in social media engagement before the course motivated them to start the course. 36 (80%) of the 45 respondents who filled the questionnaire agreed and strongly agreed that early engagement on social media motivated them to start the course. According to Reich (2014), attrition rates are highest in the first part of a MOOC course, and it was recommended that course developers should take note of this, and it was further suggested that course instructors should consider making the course in the beginning inviting.

Objective 2. *To find out how motivated students are in engaging in the course social media interactions during the course.*

The results show that 45 (88.23%) of the 51 students agreed that they were motivated to engage in social media interactions. Social interaction has been suggested as crucial for sustaining learners in traditional online courses (Jaggars, 2014).

Objective 3. *To find out the relationship between motivational factors (intentions) of social media participants and completion.*

The results show that there is no relationship between the intentions of social media participants and completion. In order words, students' achievement cannot be predicted from their intentions. Koller, et al., (2014) report that MOOC retention should reflect carefully in the context of learner intent, especially given the diverse backgrounds and motivations of students who registered. Furthermore, Koller et al., (2014) emphasise that knowing the intentions helps to highlight and comprehend the value gotten from MOOCs by the "non-completing" and "completers", which can help instructors offer students with the learning experience best suitable to their needs.

Objective 4. *To find out if there are significant mean differences in course engagement between MOOC learners who engage in Social Media and those who do not.*

The results reveal that there are no significant differences in participation, page views, and for activity volume and assignment, there is significance between those engaged in social media and non-social media.

Objective 5: *To find out if there are significant differences in retention between MOOC learners who engage in Social Media and those who did not.*

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The results show that there were significant differences in retention between those engaged in social media and non-social media.

Objective 6: *To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC.*

The results of the qualitative studies reveal that early engagement with social media assisted the learners in motivating them to start the course, network, sharing, accessibility, sense of community and obtained quick responses and drawback included distraction and posting of irrelevant materials. The focus group study also shows that WhatsApp benefitted the participants by enabling them to network, get quick responses, share videos, images, links and accessibility.

7.2 Strengths of the Research Design

This study began with an in-depth literature review of what other researchers have done as regards to using social media in MOOCs, methodologies, approaches and results. Most research done at the moment shares students experiences of using social media in MOOCs, but there are no approaches where there is a comparison between those who used social media and those who did not, in terms of course engagement, retention and completion. For instance, some of the few types of research that were done in this area is that of Zheng et al., (2016) who studied the role of Social Media using Facebook in a Coursera MOOC. The studies used a questionnaire to obtain data on students' perceived experiences. The results show that students were more engaged in Facebook groups than the MOOC discussion forums. Kizimchuk et al., (2016) carried out a study on where they used Twitter and Facebook to design MOOCs for emotion and community. The studies found that boosting inclusion and the growth of a community enhanced online engagement through employing activities specifically intended to encourage teamwork and engagement.

In addition, Liu et al., (2016), in their studies, used a questionnaire to examine the use of Twitter and Facebook as an extra MOOC social space. The results show that Social media tools could supplement the learning experiences by offering an environment for resource sharing, linking with others, upsurge interaction, and provide a space to support individual moods or learning thoughts.

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Also, using an ethnographic approach, Milligan et al., (2013) examined the engagement pattern in connectivist MOOCs and Vivian et al., (2014) followed the activities of a group of the university on Facebook for a semester. Both studies show that social media positively affected students in motivating them and improved participation. Additionally, Jiang and Kotzias, (2016) use social network analysis to access the use of social media in Massive Open Online Courses. While Jiang and Kotzias, (2016) report that twitter failed to stimulate learner-learner interactions because learners tend to form ties with instructors instead of students. Webmann et al., (2014) report that students use of Wiki-Learnia acts as a search engine for e-learning content and extended their understanding on particular subjects and enhanced learning.

Joksimovic et al., (2015) and Kop (2011) also use mixed methods to study the analysis of discourse and learning experiences in cMOOC. The results of Kop (2011) show that most participants did not attain these activities combination, formation, and sharing. Joksimovic et al., (2015) also report that in regardless of reading recommendation by teachers, learners focussed instead on numerous prominent topics that developed quickly on the course.

Most of these studies report about the perceived experiences, students' interaction patterns, of using social media in MOOCs. Presently, there is no empirical evidence to show that research studies have used social media between registration for a MOOC course and the start of the course using the mixed methodology approach and focus group (Ripiyee et al., 2016; 2017). Thus, using the first MOOC as baseline data, the study was able to redesign the 2nd MOOC to include social media engagement. Consequently, the pre-MOOC study, comparison in terms of course engagement, retention and completion of the two groups is what makes this study novel. In addition, different responses that affected retention and completion were incorporated in the Exit questionnaire, which provided additional information on other factors that affected completion apart from engagement on social media. This included the quality of the material, learning platform, discussion of the materials, the balance between instruction and independent students work and length of course.

Furthermore, the intentions of students were considered since it could affect retention and completion. The results show that there was no correlation between a student's intentions and completions. In other words, the completion of students could not be determined by their intentions. All these factors were considered because they can affect the validity of the research. According to Seliger and Shohamy (1989); p95

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“Validity is one of the main concerns with research. “Any research can be affected by different kinds of factors which, while extraneous to the concerns of the research, can invalidate the findings”.

This research study also both have advantages and limitations. The strength of the study was that it used a mixed-method design. A mixed-method design, together with the focus group, allowed for a deeper understanding of the explored research question (Clark and Creswell, 2008). Through the mixture of qualitative and quantitative methods, the study was able to produce a broad empirical data on students’ course engagement, retention and completion on both students who engaged in social media and those who did not, and students perceived experiences. The mixed-method design was further strengthened by additionally inviting focus group participants on WhatsApp to share their experiences.

7.3 Contribution to knowledge

Overall, findings from this research contribute to the body of knowledge in improving MOOC engagement and retention, and a contribution to an understanding of the notion of motivation, precisely regarding enhancing motivation in a MOOC course using social media.

- The result from this research has provided some strong evidence for instructional designers and instructors who wish to incorporate social media in MOOCs or online courses in such a way that it would enhance motivation and improve retention.
- Results from the data analysis revealed that social media students who sign up for the course and started as compared to the non-social media was 20% higher in social media group. Thus, considering the recent developments in MOOCs about retention, this study could be used to advise educators to support their learners by engaging them in social media early, before they start the course, to build a sense of community and increase the proportion of those who sign up to start the course.
- Students in a MOOC most times need to work independently and at their own speed, and therefore Li and Moore, (2018) recommend that future studies could examine whether experimental design approaches can affect learners’ motivation and retention. The experimental design in this research could be beneficial for MOOC designers to understand how they can improve their motivation with social media across the entire

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lifecycle of the course, i.e. from registration to course start, and throughout the course. According to Baird and Fisher, (2013), social media is arguably able to enable the formation of a learning community, inspiring learner engagement, involvement, and improve the general learning experience for a new generation of learners raised in the 'always-on' world. As stated by Salmon, et al., (2015 p1)

“MOOC designers’ knowledge of online participant motivations and their ability to design pedagogical pathways accordingly can be a key factor of ultimate participant’s success and avoidance of very high attrition rates typical of MOOCs”.

- WhatsApp also serve as a huge spark for discussions as communication was swift and response time was fast, as shown in the results, which establish that WhatsApp had the highest forum posts, follow by Facebook, and then Google hangouts with the fewest. The focus group study on WhatsApp also show that it assists students to share links, images, post audio and text messages, obtain quick responses of questions, ease of communication, sense of community, bonding and networking. Therefore, MOOC designers are encouraged to use WhatsApp in MOOCs to promote interactions, engagement and quicker responses. These are vital factors that enhance retention (Salmon et al., 2015). As at the time of this study, there is no statistical evidence that shows the use of WhatsApp in MOOCs focus group study and the impact it can have in motivating students.
- Also, this research also adds to the literature by presenting that future research could specifically address student’s choices and attraction for joining social media when taking a MOOC, and how the different social media affordances affect students’ motivation to engage in social media before the start of the course. Research in these areas could provide more in-depth insights to help course designers on the choice of social media platforms, and course design activities that would enhance motivation and improve retention. This method would involve scaffolding students to see themselves as part of the MOOC community even before the course begins, of which they would create. This assertion was also emphasised by Joksimovic et al., (2015), who report that when using consistent pedagogical approaches, social media could raise and strengthen social interactions over conventional discussion boards.

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- The results also show that course engagement between social media and non-social media engagers differed significantly in (activity volume, assignment and retention) but in (participation and page view) it was not significant. Also, the results in section 6.5.5 shows that the course engagement variables of WhatsApp learners in page views and participations was high, followed by Facebook and Google Hangout. This indicates that engaging in social media could make a difference in students' interactions with the learning materials as motivation to network on these platforms could enhance persistence in the course and completion. There was a significant difference in retention between those engaged in social media than those who did not participate, and the completion rate was higher in social media engagers (24.5%) than in non-social media engagers (10.8%).
- In conclusion, this research study also contributes to the body of knowledge about how students use social media in MOOCs. Through examining students' use of social media on students' motivation in MOOCs, this study has opened a window into one part of students' online social worlds and has revealed insights to the way social media interactions influences students' motivation as they learn online. Through the rise of social media, learners are now connected globally and can relate, share information and ideas, contribute and collaborate with people from all over the world, anytime, anywhere (Albion, 2011; Ito, et al., 2012; McLoughlin and Lee, 2007; Siemens and Matheos, 2010; Saijing et al., 2016; Weller, 2007).

7.4 Discussions

While retention is still a significant issue in MOOCs, this study demonstrates that engaging students on social media can motivate students who sign up for the course to start and enhance retention, quick responses, networking, increase access, better course understanding etc. This agrees with the studies of Sharma (2018), who report that in their majority of respondents who used social media in their MOOCs were aware of the positive's benefits. They felt that it created collaborative learning environment, more engaging and motivating, provided learners with a more relaxed platform for sharing thoughts, clearing their doubts and improved chances to get feedback and support from the participants and the course instructor.

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Furthermore, Sharma (2018) also report that the positives of MOOCs combined with social media would encourage students to take MOOCs, and therefore advise educators to exploit them as a handy and efficient tool for collaboration. It is also relevant to learn about how Facebook, Google Hangout and WhatsApp companies centre their products on a social design (Facebook, 2018, WhatsApp, 2018). These products are designed around the needs of how humans communicate with one another, and therefore, MOOC designers could take the perspective of social learning design to engage their learners on these platforms. According to Vivian et al., (2014), in her studies of following up students' journey on Facebook, students reported that social network sites are their social spaces and they are using this space to create their own student-initiated academic spaces. Meanwhile, these technologies meet the needs of the informal learning purpose; it seems this is a space where students could be left to blossom on their own accord. Students could be encouraged to socialise and network on such sites with their peers before and during MOOC periods. As Vivian et al., (2014) report that as students used social network sites more, their academic activities were found to increase.

For MOOC students, social media can be a mutual social space, where students can meet and connect with their peers. Thus, encouraging students to network and using this space, as a collaborative tool is beneficial. Scaffolding students by telling them the benefits and significance of building a sense of community, relevance and skills associated with online technologies, may assist in building flourishing online learning communities in these networked spaces that would enhance motivation and retention (Liu, et al., 2016; Salmon, et al., 2015).

In general, social networking tools, according to Boholano (2017) requires critical thinking and metacognitive skills and the capability to incorporate and assess real-world scenarios and authentic learning skills for validation. Thus, using these social media tools offers students an excellent opportunity to think critically, collaborate on a project and be creative. According to Vivian et al., (2014), since students are used to these tools, they would see it that they are not left behind because they use these tools daily. Moreover, it would provide an opportunity to educate and increase collaboration between students and teachers (Dewitt, 2011).

The study shows that some students found combining MOOC with social media has enriched their learning experiences which was also reported by (Sharma, 2018; Fidalgo, et al 2014, Purser, Towndrow and Aranguiz, 2013).

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Others reported that it caused distraction and unwanted post on WhatsApp. Also, some learners were concerned about giving their mobile number. Future MOOC instructors could assure students that their number would be used solely for the purpose of the course. This will give confidence to the students and encourage them to engage on the platform. In addition, instructors could clearly emphasize on the advantages or benefits of engaging in social media to MOOCs students so that they could take advantage of these technologies to benefit their learning.

To sum up, social networks and technologies are rapidly developing. It is essential to understand how students use these tools and leverage them for online learning. Thus, promoting more collaboration in MOOCs using social media is vital and necessary to enhance more productive interaction opportunities, which have been proven by studies, including this research to enhance motivation, retention and completion.

7.5 Conclusion

This research sought to answer the research question:

What is the impact of social media engagement on learners' motivation in MOOCs?

The aim was to find out if the integration of social media alongside a MOOC could have an impact on learners' motivation, course engagement and retention.

1. To find out if early engagement in social media increases the number of students who start the MOOC from those who have registered.
2. To find out how motivated students are while engaging in social media interactions during the course.
3. To find out the relationship between motivational factors (intentions) of social media participants and completion.
4. To find out if there are significant differences in course engagement between students who engaged in social media and those who did not.
5. To find out if there are differences in retention between MOOC students who participated in the course social media and those who did not.

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6. To find out the benefits and drawbacks of engaging in social media alongside studying a MOOC.

From the results of the study, the research was successful because it achieves the objectives of the studies, it was able to carry out an experiment, collect data to answer the research question. In addition, it was able to link the evidence of engagement on social media, to motivation, retention and completion as discussed below:

7.5.1 Evidences of the impact of Social Media Engagement on Course Startup, Motivation, Retention and Completion in the MOOC study.

7.5.2 Improved Course Start

From the result, 92.5% of those who engaged in social media started the course compared to 70.7% who did not engage in social media. Even though in a typical MOOC according to Jordan (2015), 50% of those who sign up for free MOOCs do not start the course. Both groups have a high start-up with social media showing 22% higher. Besides, additional data also shows that 36 out of 45 students (80%) of students who participated in social media and responded to the questionnaire strongly agreed and agreed that their early engagement on social media motivated them to start the course. The qualitative results also support the fact that early engagement on social media can cause or motivate students to start the course.

For instance, comment by one of the social media participants states that:

“It has prepared me for the course because it's my first time of taking a MOOC. I see it an excellent tool for orientation and also mentoring”.

These data provide statistical evidences that early engagement on social media could improve students' motivation to start the course.

7.5.3 Motivation

Studies have shown that motivation is vital in sustaining online learners (Aduayi-Akue, et al. 2017). Out of the 94 students, 51 who filled the questionnaire, the results showed that the majority of students 45 (88.23%) were motivated while engaging in the social media platforms.

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The qualitative findings also strongly affirmed that apart from motivating them to start the course, it sustained their interest through the course. Two of the learners wrote:

“Continuous learning, a sense of belonging, being with likeminded people in the group, 24/7 access to knowledge sharing, guidance for learning the subject etc. have enormously enriched and enhanced my learning, which was possible because of WhatsApp”.

“Keeping me motivated; the discussion also heightened expectations of the course; it motivated me to join the course”.

This confirms with the study of Jiang and Kotzias, (2016) who report that Facebook created a sense of community among learners during MOOC period and students said that communication in the MOOC forum feels like one was collaborating in a vacuum. Therefore, Morrison (2016) recommend that if students in online learning environments participate more with peers on social media like Facebook, then there is need for further study to be done on how to incorporate social media to engage students and develop their learning experiences. This study has provided statistical evidence which shows that apart from students’ perception that their engagement on social media in the MOOC motivated them to start the course, it also heightened their expectation, created connectivity through the course.

7.5.4 Retention

The results on objective 5 show that there were significant differences in retention between those engaged in social media and non-social media. In other words, those involved in social media spent more days on the course, that is retained, and the statistical difference is significant. From the responses of the qualitative data, it also shows that the sense of community and connectivity was vital in keeping the learners engaged with the course, as one of the participants stated.

“WhatsApp support my learning because I have access to it 24/7. With its alerts, I am always available for the course as well as for learning wherever I am. Even in the crowd, while travelling, in social events etc. I can peep into WhatsApp and learn. The cool thing is that nobody will mind it because it is very normal to look at your mobile whenever you like.”

Sharma (2018) in his studies state that the positives of MOOCs joined with social media would encourage students to take MOOCs, and they recommend educators to exploit them as a competent tool for collaboration and development of cMOOCs.

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This study has shown that using social media in MOOCs can improved collaboration, built a sense of community and motivation that did sustained the learners in the course which helped to sustain retention.

7.5.5 Completion

The results show that 23 (24.8%) students completed in social media group and 21 (10.8%) in the non-social media group out of the total of 44 students. Overall completion rate was 15% as compared to the 1st MOOC (3.5%). According to Jordan (2014) average free MOOC completion rate is less than 10%, below 13% Onah, Sinclair and Boyatt (2014) and below 7% (Timeshighereducation, 2018). Other factors that affected the completion rate was also considered as the quality of material learning platform, length, of course, the balance between instruction and independent work. Besides, the intention of learners was considered. Nevertheless, results from the correlation between motivational factors and intentions showed that there was no correlation, which indicated that learners' completion could not be predicted from their intentions. Thus, apart from students' intent and other factors mentioned, it is obvious from the results that social media played a crucial role in motivating social media engagers to persist on the course as compared to non-social media engagers. This conclusion was further supported by the qualitative data where some participants firmly state that engaging in social media help retain them in the course to completion. For instance, this statement

“Without joining the WhatsApp group, I would have probably opted out of the course, but the support, bond, network, videos, sharing of ideas has had a great impact on my learning experience and persistence to the end”.

In conclusion, results from the analysis reveal that 24.8% completion rate among the social media learners shows a marginally higher completion as compared to the average completion rate of between 7-13% in most free MOOCs.

8.0 Limitation & Future work

This section talks about the possible future directions for the research and suitable areas for future study are presented. The results and experimental approach developed in this research can be adopted and further developed by instructional designers who wish to incorporate social media in MOOCs.

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While this research has accomplished its main aims, some limitations are highlighted, and the next area of research that emerges from this study raises several questions for future work. Future work might want to investigate how age, gender, qualifications or geographical location might affect engagement and retention. Although this data was collected as part of the Canvas welcome survey, the analysis was not done because the research question and objectives did not require it to be analysed.

Also, since in the connectivist viewpoint, social network analysis serves a significant role in understanding the learning models in the digital age, social network analysis was not done to examine the interaction patterns in the different social media platforms (Jiang and Kotzias, 2016). Lockyer et al., (2013) propose that social network analysis enables researchers and instructors to evaluate the learning design and how learners interact with each other and with instructors. This would help online instructional designers to have an improved understanding of the diverse communication patterns in these platforms and how these align with the intended learning design (Jiang and Kotzias, 2016).

There are also opportunities for research to explore the differences between different social media platform features and how each of these features impacts on students learning. The study has shown that the mobile app, WhatsApp had high engagement and the qualitative data revealed that the features of texting, audio, sharing images and links were critical reasons for choosing the platform. Besides, the fact that students do not need to log in were useful features that enhanced engagement. MOOC designers could consider this when selecting social media platforms. Therefore, investigating how students use these features embedded in these applications to support their learning and how this compares to other social media features would be a valuable opportunity for future research.

Finally, the development and research in MOOCs now are mostly focused on how to improve engagement and retention. Since there is evidence that social interactions also promote the performance of learners in online learning, there is, therefore, a need to explicitly encourage the use of social media in MOOCs and online learning. This research can assist MOOC developers in understanding the importance of social media in online learning and leveraging it to motivate students.

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In conclusion, this research provides statistical evidences that early engagement on social media could enhance learners' motivation to start a MOOC course, and that it could enhance interaction with course materials, improve retention and completion.

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APPENDIX 1

PARTICIPANT CONSENT FORM

Dear Participant,

You are being invited to participate in a research study on “*Examining the Impacts of Social Media on Learners Motivation in a MOOC Course.*”

The purpose of this research is to explore and examine the impacts of social media engagement on MOOC learners’ motivation. Therefore, if you consent to participate in this research, you will need to have or open Facebook or google accounts. Three social media groups for the course are available for you to utilize for your learning in this MOOC. You are encouraged to join any of the group (ONE ONLY) created for the course on Facebook group, Google hangout, and WhatsApp. You are encouraged to interact by expressing your opinions on the weekly course topics and commenting on others’ contributions.

What to Expect: “There are questionnaires that will be administered online. The survey should take no longer than 5 minutes to complete - in most cases, much less. You must complete each question before moving on to the next.

Your Rights: Your participation in this research is voluntary. You can withdraw your consent and participation before the commencement of the MOOC course.

Confidentiality Data held is confidential and secure under the terms of University ethics guidelines and the UK Data Protection Act (1998). Therefore, your participation and honest feedback is highly valued. Individual’s names will not be collected, and the data is for research purpose only.

Contacts: You may contact the researcher, if you need further information or explanation on the study Prof Liz Bacon or Puna Ripiye

If you choose to participate, by clicking “*Yes, I want to join social media group*” and click NEXT, you are indicating that you freely, voluntarily and agree to participate in this study and you also acknowledge that you are at least 18 years of age.

APPENDIX 1

If you do not wish to participate in the research study, please decline participation by clicking the link "*No, I do not want to join social media group*" button.

Thanks for your participation.

APPENDIX 2

WELCOME SURVEY

This questionnaire is designed to obtain demographic information, information on your existing use of social media tools and your plans for its use in this MOOC, if any. Please indicate your responses by clicking on the option boxes. This should take less than 5 minutes of your time. Your cooperation is appreciated and will be respected. Data held is confidential and secure under the terms of University ethics guidelines and the U

K Data Protection Act. When you have finished, please click "Finish survey" to save your answers and exit. For further information or if you have a query, please contact: Puna Rapiye (mp97@gre.ac.uk).

What is your primary reason for taking an open online course?

- ☐ I like the format (online)
- ☐ I enjoy learning about topics that interest me
- ☐ I enjoy being part of a community of learners
- ☐ I hope to gain skills for a new career
- ☐ I hope to gain skills for a promotion at work
- ☐ I am preparing to go back to school
- ☐ I am preparing for college for the first time
- ☐ I am curious about MOOCs
- ☐ I want to try Canvas Network
- ☐ Course offered by University of Greenwich
- ☐ Relevant to my future education

APPENDIX 2

- ☐ To earn a certificate/statement of accomplishment
- ☐ My friends on social media invited me to join
- ☐ Relevant to academic research

Not everyone has the same participation and learning goals. We welcome the diversity.

Which type of online learner best describes you?

- ☐ An observer. I just want to check the course out. Count on me to “surf” the content discussions, and videos but don’t count on me to take any form of assessment.
- ☐ A drop-in. I am looking to learn more about a specific topic within the course. Once I find it and learn it I will consider myself done with the course.
- ☐ A passive participant. I plan on completing the course but on my own schedule and without having to engage with other students or assignments.

How many hours a week are you planning to spend on this course?

- ☐ Less than 1 hour
- ☐ Between 1 and 2 hours
- ☐ Between 2 and 4 hours
- ☐ Between 4 and 6 hours
- ☐ Between 6 and 8 hours
- ☐ More than 8 hours per week

How will this course help you meet your personal or professional goals?

APPENDIX 2

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Question 5

What is your highest level of education?

- ☐ High School or College Preparatory School
- ☐ Some college, but have not finished a degree
- ☐ Completed 2-year college degree
- ☐ Completed 4-year college degree
- ☐ Some graduate school
- ☐ Master's Degree (or equivalent)
- ☐ Ph.D., J.D., or M.D. (or equivalent)
- ☐ None of these

Question 6

Is English your primary spoken language?

- ☐ Yes
- ☐ No

Question 7

Where do you live?

APPENDIX 2

- ☐ North America
- ☐ Central America
- ☐ South America
- ☐ Caribbean
- ☐ Western Europe
- ☐ Eastern Europe
- ☐ Africa
- ☐ Middle East
- ☐ South Asia
- ☐ East Asia
- ☐ Southeast Asia
- ☐ Russia
- ☐ Australia & South Pacific

Question 8

What is your gender?

- ☐ Male
- ☐ Female

APPENDIX 2

☐ Other

Question 9

How old are you?

☐ 13-18

☐ 19-24

☐ 25-34

☐ 35-44

☐ 45-54

☐ 55-64

☐ 65 or older

Question 10

How did you hear about this Canvas Network Course? (Select all that apply)

☐ Through a social media site (like Facebook or Twitter)

☐ From a news story (print, online, radio, or TV) that mentioned Canvas Network

☐ From a friend or colleague

☐ I clicked on an advert

☐ From a web search

☐ From the instructor

APPENDIX 2

☐ From a Canvas or Canvas Network communication

Question 11

Where have you taken an online course before? (Select all that may apply)

☐ Never taken an online course

☐ At school

☐ Canvas Network

☐ Coursera

☐ EdX

☐ Udacity

☐ FutureLearn

☐ Other

Question 12

Have you taken an entrepreneurship course before (either as the main topic or a subsidiary topic)?

☐ Yes

☐ No

Question 13

How often do you use social media?

☐ Daily

APPENDIX 2

- ☐ Few times a week
- ☐ Few times a month
- ☐ Rarely
- ☐ Never

Question 14

How motivated are you to engage with this course?

- ☐ Highly Motivated
- ☐ Motivated
- ☐ Partially Motivated
- ☐ Not Motivated
- ☐ Don't know

APPENDIX 3

Motivation Questionnaire

User ID (registered email; Please, provide your email address, the one you used in registering in canvas. The purpose of this is to match your responses to this survey with your canvas course activities).

1. Which of the following course Social Media platforms are you engaged in?

- ☐ Facebook
- ☐ WhatsApp
- ☒ Google Hangouts

2. How motivated are you engaging in this MOOC Social Media group?

- ☐ Strongly motivated
- ☐ Motivated
- ☐ Partially motivated
- ☐ Not motivated
- ☐ Don't know

3. When did you start engaging in the Social Media interactions?

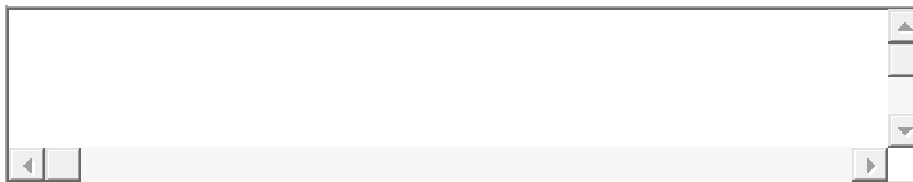
- ☐ Before the course started
- ☐ After the course started

3. My early engagement with the MOOC Social Media group before the course began, motivated me to start the course.

APPENDIX 3

- ☐ Strongly Agree
- ☐ Agree
- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Don't know
- ☐ Not Applicable because I joined the course social media group after the course started

5. What are your perceived benefits or drawbacks in using the MOOC Social Media group before the start of the course (list at least 3).



Finish Survey

APPENDIX 4

EXIT QUESTION

Question 1

How much of the course did you complete?

- ☐ Most of it
- ☐ About three quarters of it
- ☐ About half
- ☐ Less than a quarter

Question 2

If you did not complete everything you wanted to do in the course, please indicate the reasons for non-completion (Please tick all that apply).

- ☐ I didn't intend to complete
- ☐ I already knew some of the course topics
- ☐ I didn't understand the course material
- ☐ I didn't understand the assessment tasks
- ☐ I found difficulty in using the learning platform
- ☐ It wasn't what I expected
- ☐ I found the time required too demanding
- ☐ I left for personal reasons
- ☐ I didn't feel able to engage with my fellow students on the course forums

APPENDIX 4

Question 3

If you completed the course what helped you?

- ☐ Quality of materials
- ☐ Discussion in forums
- ☐ Use of external Social media (Facebook/WhatsApp/Google Hangouts)
- ☐ The learning platform
- ☐ Tutor interaction
- ☐ The balance between instruction and independent student work
- ☐ Length of the course (5 weeks)
- ☐ Student effort per week

Question 4

Please, add any comments you would like to make about the course.

Finish survey